MDP-550/650/A3

RMT-M33A(550)/M37A(650)/M37B(A3)

SERVICE MANUAL

US Model
Canadian Model
MDP-550/650
E Model
Hongkong Model
MDP-A3

(Photo: MDP-550)

SPECIFICATIONS

System

Type
CD/CDV/LD player

Signal readout
Optical (Laser beam reflection)

Signal format system
EIA standard, NTSC color system

Playing time
See "Optical discs" on page **30**.

Digital audio specifications

Signal-to-noise ratio
More than 115 dB (EIAJ)*

Dynamic range
More than 99 dB (EIAJ)

Wow and flutter
Below measurement limit (+0.001 % W.PEAK)(EIAJ)

Video specifications

Horizontal video resolution
425 lines

Signal-to-noise ratio
More than 50 dB

* Measured according to EIAJ (Electric Industries Association of Japan) standards.

Input and Output

LINE OUT 1,2
VIDEO output, Phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced
AUDIO output, Phono jacks (2)
Stereo L, R
Analog: 200 mVrms
(1 kHz, 40 % modulation)
Digital: 200 mVrms
(1 kHz, –20 dB)

S VIDEO OUT 1,2
Luminance: 1 Vp-p, 75 ohms, unbalanced, sync negative
Chrominance: 0.286 Vp-p, 75 ohms, unbalanced

DIGITAL OUT (OPTICAL)
–18 dBm, wavelength 660 nm

Headphone output
12 mW (Impedance = 8 ohms)

Mic jack
Standard jack
1 mV
(Impedance below 1 kilohm)

General

Power requirements
120 V AC, 60 Hz (550/650)
110-127/220-240 V AC, 50/60 Hz (A3)

Power consumption
45 W

Operating temperature
5 °C to 35 °C (41 °F to 95 °F)

Ambient humidity
5 % to 90 %

Dimensions
Approx. 430 × 116 × 433 mm
(17 × 4 5/8 × 17 inches)
(w/h/d)
including projecting parts and controls

Mass
Approx. 7.5 kg (16 lb 8oz)

Supplied accessories

Remote Commander RMT-M37A(1)(650)
RMT-M33A(1)(550)
RMT-M37B(1)(A3)
size AA (R6) batteries (2)
Audio/Video Cable
(phono plug 3 ←→ phono plug 3) (1)
AC power cord (1)

使用時は添付資料も参照のこと
Refer to the additional documents.

CD/CDV/LD PLAYER

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replace-ment.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

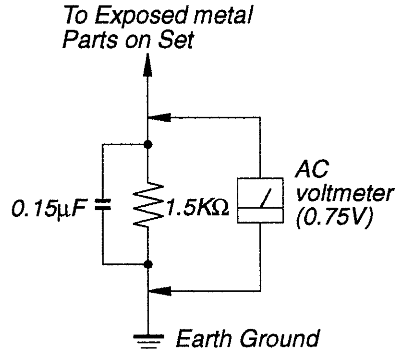


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage form any exposed metal parts to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as Simpson 229 or RCA WT-540A. Follow the manufactures' instructions to use these instruments.
2. A battery operated AC milliammerter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate lowvoltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

SAFETY-RELATED COMPONENT WARNING!!

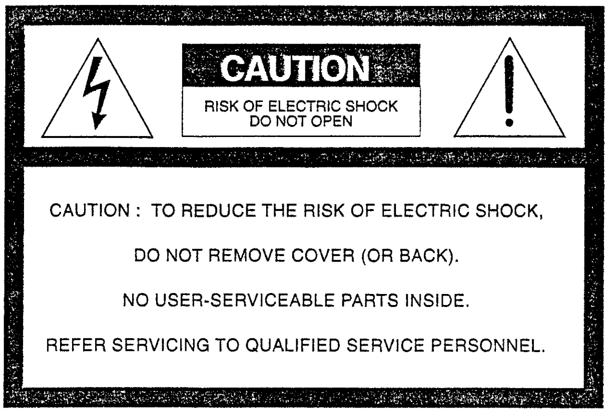
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

WARNING

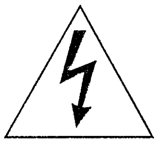
To prevent fire or shock hazard, do not expose the unit to rain or moisture.



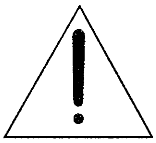
CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION

To prevent electric shock, do not use this polarized AC plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

CAUTION

The use of optical instruments with this product will increase eye hazard.

As the laser beam used in this player is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

TABLE OF CONTENTS

1. GENERAL

Unpacking ··························1-1
Inserting batteries into the remote commander ··············1-1
Connecting the player ··························1-1
Playing a disc ··························1-2
Resuming LD playback (Auto Resume) ······················1-3
Quick-starting LD playback (Quick Start) ······················1-4
Using enjoyable functions for viewing movies ··············1-4
Searching for a particular point on the disc······················1-5
Using the sound control functions ······················1-5
Understanding on-screen indications ······················1-6
Specifying a chapter or track directly
(Chapter/Track Search) ······················1-7
Searching by frame number or time (Frame/Time Search)···1-7
Viewing frame-by-frame action ······················1-8
Viewing at varying speeds (Variable Speed Play) ············1-8
Playing in a specified order (Program Play) ··················1-9
Playing a section repeatedly (Repeat Play)······················1-10
Playing karaoke ······················1-11
Optical discs ······················1-12
Index to parts and controls ······················1-13

2. DISASSEMBLY

2-1. REMOVAL OF FRONT PANEL ASSEMBLY ······2-1
2-2. OPENING OF MB-717 BOARD
(SERVICE POSITION) ······················2-1
2-3. REMOVAL OF CHUCKING BLOCK AND TRAY
ASSEMBLY ······················2-2
2-4. MOUNTING THE CHUCKING BLOCK AND TRAY
ASSEMBLY ······················2-2
2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE
ASSEMBLY ······················2-3
2-6. REMOVAL OF FEED BASE BLOCK
ASSEMBLY ······················2-3
2-7. MOUNTING THE FEED BASE BLOCK
ASSEMBLY ······················2-4
2-8. OPTICAL PICK-UP BLOCK ······················2-5
2-9. REMOVAL OF CONTROL GEAR ······················2-8
2-10. REMOVAL OF IDLER GEAR ······················2-8
2-11. INTERNAL VIEWS ······················2-9
2-12. CIRCUIT BOARDS LOCATION ······················2-10

3. DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM ······················3-1
3-2. VIDEO BLOCK DIAGRAM ······················3-4
3-3. SERVO BLOCK DIAGRAM ······················3-7
3-4. SYSTEM CONTROL BLOCK DIAGRAM············3-10
3-5. MODE CONTROL BLOCK DIAGRAM··············3-13
3-6. AUDIO BLOCK DIAGRAM ······················3-15
3-7. POWER SUPPLY BLOCK DIAGRAM ··············3-17

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM······················4-1
4-2. PRINTED WIRING BOARDS AND SCHEMATIC
DIAGRAMS ······················4-3
·MA-712 (Mic), HP-718 (Headphone) Boards ······4-3
·MB-717 board
(Video, Servo, System Control, Audio) Board ······4-6
·MB-717 (Video) Board ······················4-12
·MB-717 (Servo) Board ······················4-15
·MT-707, SW-732 boards······················4-18
·MB-717 (System Control)
MT-707, SW-732 Board ······················4-19
·MB-717 (Audio), MA-712 (Mic),
HP-718 (Headphone) Boards ······················4-23
·BI-703, FG-705, FG-707, MT-706 Boards············4-27
·FP-746 (Display), FP-747 (Play Switch),
PW-721 (Power Switch) Boards ······················4-31
·POWER BLOCK SR-539 (MDP-A3 Model)·········4-38
·POWER BLOCK SR-538 (MDP-550/650 Model)···4-43

5. REPAIR PARTS LIST

5-1. EXPLODED VIEWS
5-1-1. CASE AND FRONT PANEL ASSEMBLY ······5-1
5-1-2. CHUCKING BLOCK ASSEMBLY ··············5-2
5-1-3. MAIN CHASSIS ASSEMBLY ······················5-3
5-1-4. MECHANISM DECK ASSEMBLY ··············5-4
5-2. ELECTRICAL PARTS LIST ······················5-5

6. IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL
MICROCOMPUTER
(IC501: MB89094PF-G-141-BND
on the FP-717 Board) ······················6-1
6-2. TERMINAL FUNCTION OF MODE CONTROL
MICROCOMPUTER
(IC102: MB89095 on the FP-746 Board) ··············6-2

7. ELECTRICAL ADJUSTMENTS

7-1. LIST OF SERVICING JIGS······················7-1
7-2. CAUTIONS ON ADJUSTMENT······················7-1
7-3. OPERATION OF THE MDP-550/650/A3 WITH
HIDDEN KEY FUNCTIONS ······················7-1
1. Explanation of the hidden key functions ··············7-1
2. How to use “simultaneous main-unit-key-press
functions” ······················7-1
3. How to use “simultaneous main-and-remote-
control-units-key-press functions” ······················7-2
7-4. OPERATION OF THE MDP-550/650/A3
IN THE SERVICE MODE ······················7-2
1. Explanation of the service mode ······················7-2
2. Entering the service mode······················7-2
3. Quitting the service mode ······················7-3
4. Operating with the special key functions ··············7-3

7-5. OPERATION OF THE MDP-550/650/A3 IN THE DEBUGGING MODE ·························7-3
1. Explanation of the debugging mode ······················7-3
2. Entering the debugging mode ····························7-3
3. Quitting the debugging mode ····························7-4
4. Changing the display on the screen ······················7-4
5. Explanation of the debugging display ···················7-4
7-6. POWER SUPPLY ADJUSTMENT ······················7-10
7-6-1. EVER 5V Adjustment (POWER BLOCK) ····································7-10
7-6-2. REG +5V Adjustment (POWER BLOCK) ····································7-10
7-6-3. Power Supply Check (POWER BLOCK) ····································7-10
7-7. SYSTEM CONTROL SYSTEM ADJUSTMENT ···7-10
7-7-1. Microprocessor Clock Adjustment (MB-717 Board) ······································7-10
7-8. SERVO SYSTEM ADJUSTMENT ······················7-11
7-8-1. LD Side A Tilt Balance Adjustment ···············7-11
7-8-2. LD Side B Tilt Balance Adjustment ···············7-12
7-9. VIDEO SYSTEM ADJUSTMENT ······················7-13
7-9-1. Video Output Level Adjustment (MB-717 Board) ······································7-13
7-10. ADJUSTMENT AFTER THE ATTACHMENT OF THE OPTICAL PICK-UP BLOCK ···············7-13
7-10-1. Jigs and Tools ··7-13
7-10-2. CD Adjustment ·······································7-14
7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT···7-16

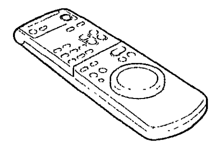
SECTION 1
GENERAL

This section is extracted from instruction manual (MDP-650).

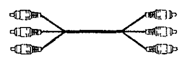
Step 1 Unpacking

Check that you have the following items:

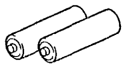
- **Remote commander RMT-M37A**



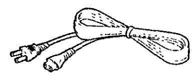
- **Audio/Video cable**



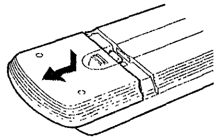
- **Two size AA (R6) batteries**



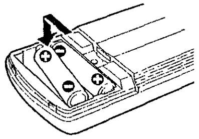
- **AC power cord**



Step 2 Inserting batteries into the remote commander



1 Turn the commander over, and remove the cover.



2 Check the polarities and position two size AA (R6) batteries correctly.

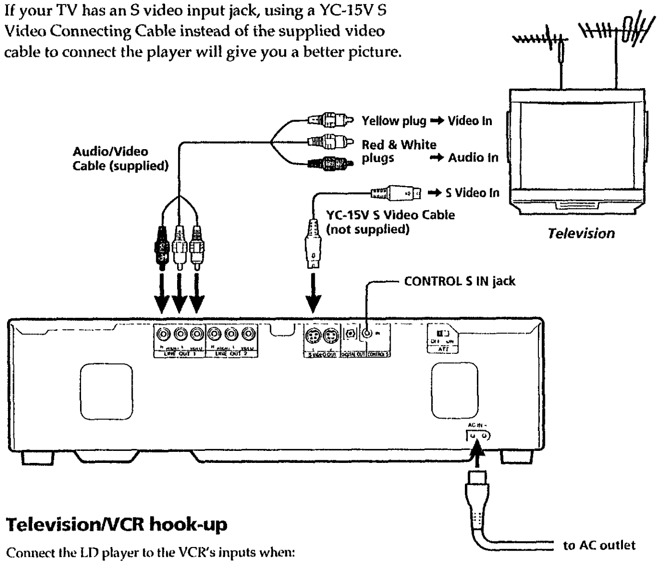
3 Close the cover.

Notes
- With normal use, the batteries should last for approximately six months.
- Use two size AA (R6) batteries.
- If you use the batteries incorrectly, they may leak or explode. See notes below for correct usage.
  - –Insert the batteries with correct polarity as shown above.
  - –Do not use a new battery together with an old one.
  - –Do not use different types of batteries together.
  - –Do not recharge the batteries.
  - –If you are not going to use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
  - –If battery leakage should occur, wipe off the leakage from the battery compartment, then insert new batteries.
- Do not let direct sunlight or powerful artificial light such as spot light fall directly on the remote sensor on the front panel of the player. Such light interferes with the signals from the remote commander, causing the remote commander to fail to operate correctly.

Step 3 Connecting the player

Television hook-up

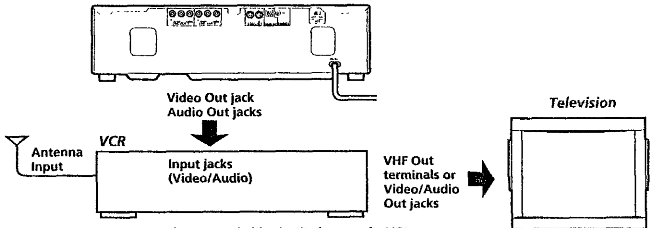
To play LDs or CDVs, hook up a television to the LD Player. Take out the supplied audio/video cable (yellow, red and white plugs). Use this to connect the player to the television. Once you have hooked-up the television, set the input selector on the TV to "Video." Before connecting or disconnecting any of the cables, turn off all equipment. If your TV has an S video input jack, using a YC-15V S Video Connecting Cable instead of the supplied video cable to connect the player will give you a better picture.


Audio/Video Cable (supplied)
Yellow plug → Video In
Red & White plugs → Audio In
→ S Video In
YC-15V S Video Cable (not supplied)
Television
CONTROL S IN jack
to AC outlet

Notes
- Make sure all equipment is turned off before connecting or disconnecting any cables.
- Connection methods may differ; when in doubt about a connection, consult the TV or VCR manufacturer's manual.
- If the sound or picture is disturbed by noise, try moving the equipment farther apart.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- To prevent interference with TV broadcast reception, turn off all equipment connected but not currently in use.
- If your TV only has a monaural phono jack for audio input, use a VMC-910/915 Connecting Cable (not supplied).
- If you connect the CONTROL S IN jack to the CONTROL S output jack on your TV, etc. using an RK-G69 Connecting Cable (not supplied), you can control this player with the remote commander pointed at the TV, etc.
- If you plug one end of the cable into the CONTROL S IN jack on the player and leave the other end unplugged, the remote commander cannot control the player.

Television/VCR hook-up

Connect the LD player to the VCR's inputs when:
- –the video inputs of the TV are already used for the VCR or a similar machine.
- –the TV has only an antenna input.


Video Out jack
Audio Out jacks
Antenna Input
VCR
Input jacks (Video/Audio)
VHF Out terminals or Video/Audio Out jacks
Television

Connect to the external video/audio inputs of a VCR.

Audio equipment hook-up

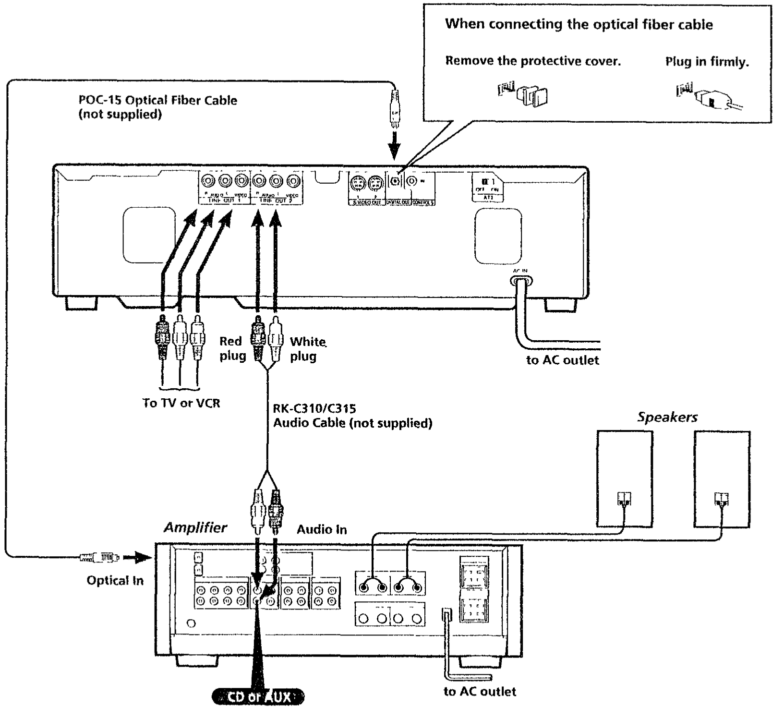
To achieve full stereo sound from your LD Player, hook up a stereo system following the diagram below. Use an RK-C310 (or RK-C315) Audio Connecting Cable (not supplied) to connect the LD Player to your amplifier or receiver. Before connecting or disconnecting any cables, turn off all equipment.

To achieve digital sound

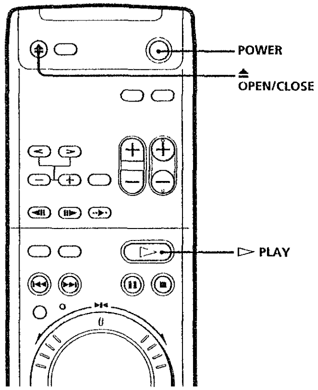
Optical fiber digital audio output enables a high quality sound reproduction. If your amplifier has an optical input connector, or if you have a D/A converter unit with optical input, connect the player to the amplifier or D/A converter using an Optical Fiber Audio Cable POC-15 (not supplied).

- You can get digital audio output from CDs, CDVs, and most LDs. When you play an LD which does not have digital sound tracks, you cannot get any sound from the DIGITAL OUT (OPTICAL) connector.
- Sound from a microphone is not output from the DIGITAL OUT (OPTICAL) connector. When you play karaoke with a microphone, connect the player using an Audio Cable (red & white plugs).

Notes
- Make sure all equipment is turned off before making any of the above connections.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- When listening to a radio broadcast, turn off the LD Player to get better reception.



Basic Operations
Playing a disc



Tip
- You can also turn on the player by pressing ≜ OPEN/CLOSE on the player.

Notes
- If you place more than one disc on the disc tray, or if the disc is not seated properly, the disc may not start playing, and may damage the disc or player.
- Do not lift up or transport the player while a disc is loaded as doing so may damage your disc or player.
- Do not use a CD stabilizer when playing a CD as doing so may damage your disc or player.
- When you press ▮▮ PAUSE, the picture freezes, even while playing a CLV LD or CDV.
- When you press ■ STOP to stop playing an LD, the picture freezes and remains on the TV screen. If you want to clear it, press the FL DISPLAY button on the player. The screen turns to a blank, blue screen. Each time you press the FL DISPLAY button, the stored picture and the blue screen alternate.

This section shows you how to play an LD, CD or CDV.

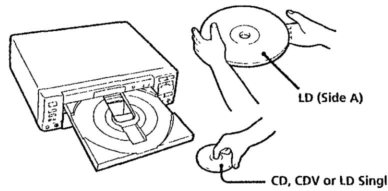
Before you start...
- Connect the player to your TV and set the input selector on the TV to "Video" (see "Connecting the player" on page **6**).
- If you use a stereo system, turn on the amplifier and set its input selector to an external input such as "CD" or "AUX" to listen to the sound of the player.

Loading and playing a disc

1 **Press POWER to turn on the player.**
You can also directly turn on the player by pressing ▷ PLAY on the player or remote commander.

2 **Press ≜ OPEN/CLOSE to open the disc tray.**
The front cover of the player automatically slides down and the disc tray comes out.

3 **Place a disc on the disc tray.**



Place only one disc on the tray, carefully fitting it in the circle on the tray.

4 **Press ▷ PLAY (or DISC SIDE A).**
The disc tray closes and the upper side of the disc starts playing. You can also start playing by pressing the disc tray to close it.
When playback of the upper side of an LD (side A) ends, the other side (side B) starts playing automatically.

To	Press
Stop play	■ STOP
Pause play	▮▮ PAUSE
Resume play after pause	▮▮ PAUSE or ▷ PLAY
Scan forward or backward	◀◀/▶▶ SCAN on the player or rotate the SHUTTLE ring
Skip chapters or tracks	⏮/⏭ ACS/AMS
Remove the disc	≜ OPEN/CLOSE

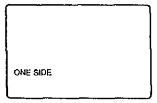
Tips
- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B," regardless of the label "A" or "B" printed on the disc.
- When playback of LD side B ends, the player stops.
- When playing a CD or CDV, the DISC SIDE B button does not function.

Tips
- The AV calendar shows the chapters/tracks remaining on the disc. As chapters/tracks are played, the corresponding numbers on the calendar disappear.
- When there is no disc in the player, "NO dISC" appears on the front panel display.

Note
- The AV calendar is available when you play LDs containing TOC (Table of Contents) data, CDs or CDVs. When you use the AV calendar with those LDs, press the QUICK START button to turn off the button indicator before you start playing (see "Quick-starting LD playback" on page **11** for details). When you play CDs or CDVs, the QUICK START indicator goes off automatically and the AV calendar always appears.

To start playing from the beginning of either LD side
Press DISC SIDE A to play the upper side of the LD from the beginning.
Press DISC SIDE B to play the other side of the LD from the beginning.

To play only one side of an LD
Press 1/SIDE/ALL twice. "ONE SIDE" appears briefly.
Press ▷ (Play) or DISC SIDE A/B.
The selected side of the LD is played once.



To pause playing just before starting
Press ❚❚ PAUSE instead of pressing ▷ PLAY, after you place the disc on the tray.
The disc tray closes and the player waits at the start of the disc until you press ▷ PLAY or ❚❚ PAUSE. If you want to start from side B of an LD, press ❚❚ PAUSE, then DISC SIDE B.

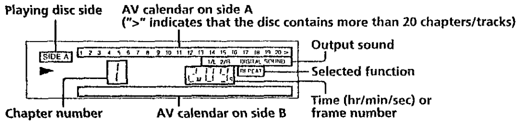
To stop playing and turn off the player
Press POWER.
You can resume playback from the point at which you stopped by simply pressing ▷ PLAY (see "Resuming LD playback" on page **10**).

To stop playing and remove the disc
Press ≜ OPEN/CLOSE.
Remove the disc and press ≜ again to close the empty tray.

To listen with headphones
Plug headphones into the PHONES jack on the front panel and adjust the volume with the LEVEL control beside the jack.

Reading the front panel display

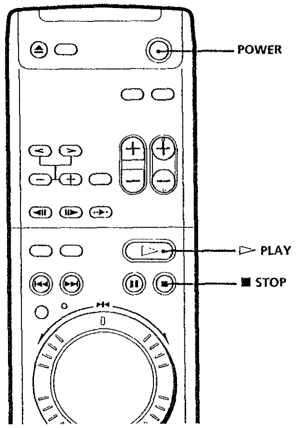
The illustration below is an example of what is displayed on the front panel of the player. For more information about the AV calendar, see the tips and note on the left hand of this page and "Quick-starting LD playback" on page **11**.



Turning off and on the front panel display

You can turn off the front panel display if you feel the display glaring while you view a movie in a dark room. Each time you press the FL DISPLAY button on the player, the display turns off/on.

Resuming LD playback (Auto Resume)



This function operates automatically only for LDs. Once you stop playing an LD by pressing ■ STOP or POWER, the player stores the point you stopped at so that you can continue viewing from the same point.

1 **Press ■ STOP (or POWER) to stop playback.**
The AUTO RESUME indicator on the player lights up and the point you stopped at is stored (if you press POWER, the indicator lights up briefly, then goes off with the power).

2 **Press ▷ PLAY.**
The player searches for the scene at which you stopped playing, then playback starts.

To pause playing just before starting
If the player is turned on, press ❚❚ PAUSE instead of ▷ PLAY.
If the player is turned off, press POWER or ▷ PLAY to turn on the player, then press ❚❚ PAUSE.

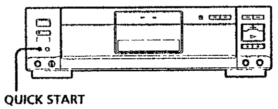
To view from the beginning of the LD
Press DISC SIDE A to start playing from the beginning of side A.
Press DISC SIDE B to start playing from the beginning of side B.
The point at which you stopped is cleared.

Tips
- Each time you stop playing, the point at which you stopped is stored.
- The point at which you stopped playing is cleared when:
  - you completely open the disc tray, press DISC SIDE A/B or ◀◀/▶▶ ACS/AMS.
  - you do a Chapter Search or Frame/Time Search.
  - you press PROGRAM.
  - you unplug the player.

If you press ≜ OPEN/CLOSE to close the disc tray when it is open halfway, the point at which you stopped is retained.

Notes
- Playback may resume at a point slightly different from the point at which you stopped playback.
- The point at which you stopped is not stored if you stop playback during a Chapter Search or Frame/Time Search, or while in program mode.
- If you press ▷ PLAY when the power is off, the player turns on automatically. If a disc is loaded, playback resumes where you last stopped.

Quick-starting LD playback (Quick Start)



The Quick Start function remarkably shortens the starting time of an LD by skipping the TOC data read procedure. When the QUICK START button indicator on the player is lit, the Quick Start function is active and you can start playing the LD very quickly.

Selecting Quick Start on/off

When you turn on the player, the QUICK START button indicator always lights up and the Quick Start function is turned on.
If you turn off the Quick Start function, the player reads TOC data on the current side of the LD when the disc starts playing, allowing you to use several functions (see table below).

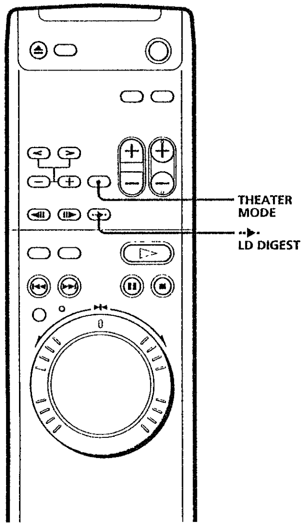
To turn off (or, then on) the Quick Start function
Press QUICK START on the player while the player is stopped.
Each time you press the button, the QUICK START button indicator is turned off/on.

Indicator	The player starts playing an LD
On	Without reading TOC data, to save time
Off	Reading TOC data, so that you can use the functions shown below: • AV calendar • Remaining time of the current chapter • Total remaining time on the current disc side • Total elapsed time for CAV discs • Total playing time of chapters you programed

Notes
- Once the player has read TOC data of an LD after you turned off the Quick Start function, you cannot turn on the Quick Start function until you open the disc tray or turn off the player.
- When you play a CD or CDV, the Quick Start function is automatically turned off.

Tip
- TOC data contains some information on the disc including amount of chapters, total playing time, and information about each chapter.

Using enjoyable functions for viewing movies



Shortening the viewing time for an LD (LD Digest)

You can quickly view an LD, in about two thirds or a half of its original playing time. In LD Digest mode, the player skips scenes at regular intervals to save one third or half of the playing time. You hear the normal speed sound as the scenes progress so that you can understand the plot of a movie, etc.

To start quick viewing
Press ··▶· LD DIGEST while playing an LD.
The LD DIGEST indicator on the player lights up and the player starts skipping scenes.
Each time you press ··▶· LD DIGEST, the on-screen indication changes as follows:

→ LD DIGEST 1 → LD DIGEST 2 ─┘

If you select "LD DIGEST 1," about one third of the playing time is saved.
If you select "LD DIGEST 2," about a half of the playing time is saved.

To resume normal playback
Press ▷ PLAY.
The LD DIGEST indicator goes off and normal playback resumes.

Getting a theater-like picture (Theater mode)

In theater mode (LDs only), the player emphasizes the black color on the recording to give the picture you see some of the depth and clarity of a movie in a movie theater. This is especially effective if you view movies in a dark room.

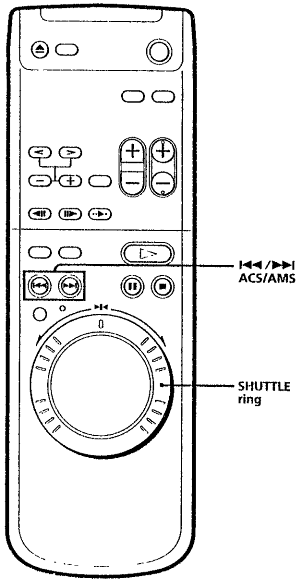
To enter theater mode
Press THEATER MODE while playing an LD.
"THEATER" appears on the screen briefly, the THEATER MODE indicator lights up and the front panel display turns off. The picture's black color becomes more black.

To exit theater mode
Press THEATER MODE again.
The THEATER MODE indicator goes off, the front panel display lights up and the player exits the theater mode.

Notes
- The sound is also skipped as the scene skips.
- You can use LD Digest only when you play an LD in normal play mode.
- You cannot use LD Digest or Theater mode when playing CDVs.
- The effect of Theater mode depends on the quantity of the blackness in the picture. If there is little blackness, Theater mode may not be effective.

Tip
- You can turn on/off the front panel display by pressing the FL DISPLAY button on the player while in theater mode. However, when you exit theater mode, the front panel display always lights up.

Searching for a particular point on the disc



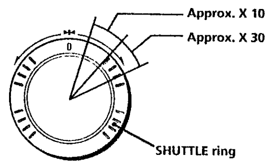
Notes
- A certain amount of visual noise and instability is inevitable when scanning an LD.
- When scanning a CLV LD or CDV, speed varies between the beginning and end of a side.

Tips
- ACS/AMS stands for Automatic Chapter Sensor/ Automatic Music Sensor.
- In addition to normal play mode, you can do Variable Speed Scan and Skip Search while in Freeze Frame, Repeat or Pause mode. After the scan or search, playback continues in the same mode.
- You can also do a Skip Search while using Multi Speed.

You can locate a particular point on a disc by scanning scenes at variable speed or skipping chapters/tracks.

Scanning a disc quickly (Variable Speed Scan)

Rotate the SHUTTLE ring on the remote commander while playing a disc.
The scanning speed changes from about ×10 to ×30 times the normal speed corresponding to the degree you rotate the SHUTTLE ring.
To resume normal playback, release the SHUTTLE ring.



You can also scan a disc by holding down the ◀◀ or ▶▶ SCAN button on the player while playing the disc. The scanning speed is constant at 10 times the normal speed.

To	Hold down
Scan forward	▶▶ SCAN
Scan backward	◀◀ SCAN

To resume normal playback, release ◀◀/▶▶ SCAN.

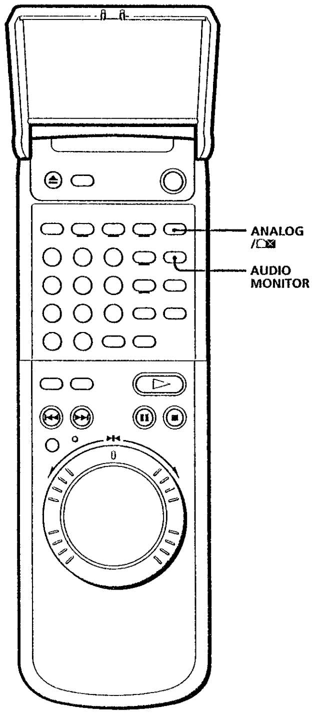
Skipping chapters or tracks (Skip Search)

Press or hold down I◀◀/▶▶I ACS/AMS on the player or remote commander.

To go to the beginning of	Press
Next chapter/track	▶▶I ACS/AMS once
Current chapter/track	I◀◀ ACS/AMS once
Previous chapter/track	I◀◀ ACS/AMS twice before the picture or sound resumes

Hold down ▶▶I or I◀◀ to skip chapters/tracks continuously.

Using the sound control functions



Notes
- The output level may differ between digital and analog sound.
- When using the DIGITAL OUT (OPTICAL) connector, you cannot alternate sound output (always 1/L 2/R).

Playing a stereo disc or Second Audio Program (SAP) disc

When playing SAP discs such as bilingual discs, you can alternate the sound output using the AUDIO MONITOR button.

To alternate the sound output
Press AUDIO MONITOR while playing the disc.
Each time you press AUDIO MONITOR, the on-screen indication changes as follows:

→ 1/L → 2/R → 1/L 2/R ─┐

The indication appears on the screen briefly, then disappears.

Indication	From stereo disc	From SAP disc
1/L	Left channel	Sound track 1 (Left channel)
2/R	Right channel	Sound track 2 (Right channel)
1/L 2/R	Stereo (Both channels)	Sound track 1 (Left channel) Sound track 2 (Right channel)

When you select 1/L (or 2/R), the sound of the left (or right) channel is output from both speakers.

Listening to analog sound on an LD

If your LD contains digital soundtracks, the player automatically outputs digital sound. To listen to sound recorded on analog soundtracks, use the ANALOG/CX button.

Press ANALOG/CX while playing the disc.
"♪ ANALOG" appears on the screen briefly and analog sound is output.

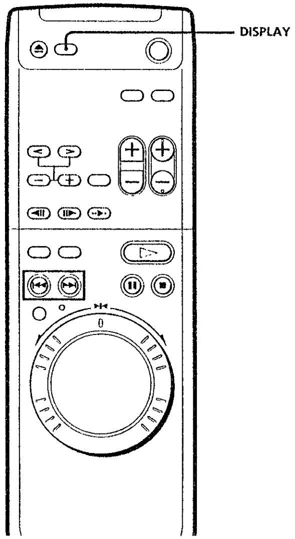
To return to digital sound
Press ANALOG/CX repeatedly until "♪ DIGITAL" appears on the screen.

Playing discs with a CX (CX) logo

LDs bearing the CX logo are recorded with the CX noise reduction system, which gives lower noise level and higher dynamic range on analog sound. The player detects most CX discs and activates the CX noise reduction system automatically when outputting analog sound. If your CX LD does not contain a code to activate the CX noise reduction system, you can activate the CX noise reduction system manually while playing analog sound.

To activate the CX noise reduction system manually
Press the ANALOG/CX button repeatedly until "CX ON" appears.
The CX noise reduction system is activated.

Understanding on-screen indications



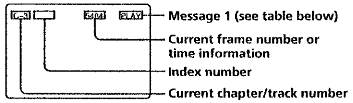
Notes

- The AV calendar (display of remaining chapter numbers) for LDs is only available when:
  - the LD contains TOC data.
  - you have turned off the QUICK START button indicator on the player.
- When playing an LD which does not contain chapters, the chapter number does not appear.
- When playing a CLV LD which does not contain time data to the second, a two-digit number such as "22:", meaning 22 minutes, appears.
- Messages concerning sound control functions such as "1/L, 2/R" or "♪ DIGITAL, ♪ ANALOG" appear only briefly when you press the AUDIO MONITOR or ANALOG/C⊠ button.

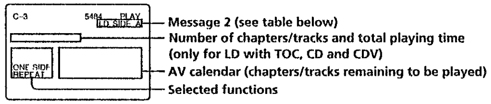
You can view the operating status of the player or disc information on the TV screen.

Displaying on-screen indications

Press DISPLAY.
The operating status of the player is displayed on the screen.


C-3
5484
PLAY
Message 1 (see table below)
Current frame number or time information
Index number
Current chapter/track number

Press DISPLAY again.
Operating status and disc information are displayed on the screen.


C-3
5484
PLAY
LD SIDE A
ONE SIDE REPEAT
Message 2 (see table below)
Number of chapters/tracks and total playing time (only for LD with TOC, CD and CDV)
AV calendar (chapters/tracks remaining to be played)
Selected functions

Press DISPLAY once again to turn off the indications.

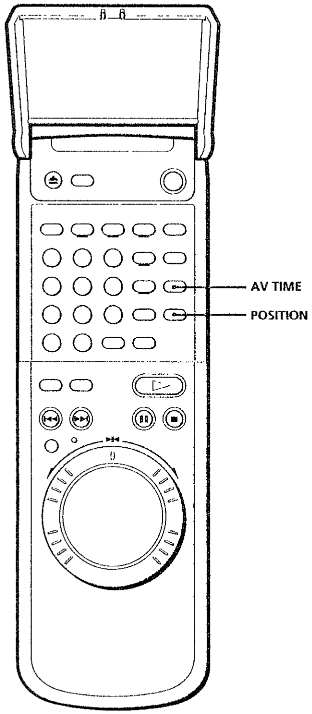
Message 1

Display	Current status of the player
OPEN	Disc tray open
CLOSE	Disc tray closed
PLAY	Playing a disc
STOP	Playback stopped
PAUSE	Playback temporarily stopped
◀◀/▶▶	Speed scanning (slow)
◀◀◀/▶▶▶	Speed scanning (fast)
SEARCH	Searching

Message 2

Display	Currently playing
LD SIDE A	Side A of LD
LD SIDE B	Side B of LD
CD	CD
CDV	CDV
1/L	First soundtrack/left channel
2/R	Second soundtrack/right channel
♪ DIGITAL	Digital sound
♪ ANALOG	Analog sound
THEATER	With real black color

Understanding on-screen indications (continued)

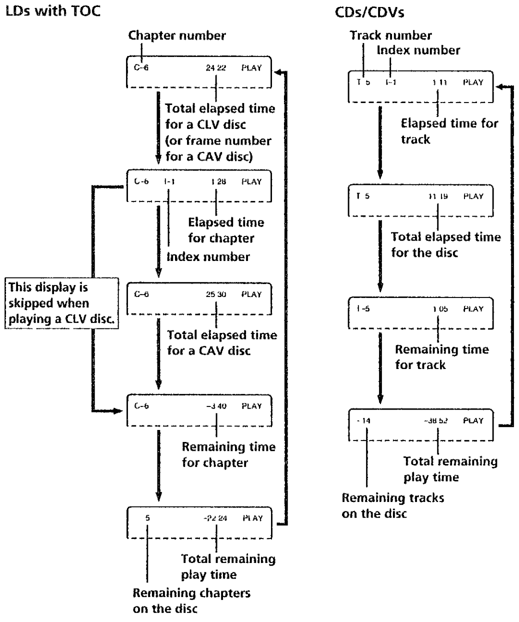

AV TIME
POSITION

Notes

- When playing an LD which does not contain TOC data, or playing with the QUICK START button indicator on the player lit, you can only view the total elapsed time (for CLV disc) or current frame number (for CAV disc).
- The display does not show remaining time for chapters or tracks numbered 51 or greater.
- When playing a CDV, these figures refer only to the current section (audio or video) being played.

Checking the elapsed or remaining time of the disc

You can check the elapsed or remaining time on the TV screen.
Press DISPLAY, then press AV TIME repeatedly.
Each time you press AV TIME, the on-screen display changes as follows. To use AV TIME while playing an LD containing TOC data, press QUICK START on the player to turn off the Quick Start function (see "Quick-starting LD playback" on page **11**).


LDs with TOC
Chapter number
C-6 24 22 PLAY
Total elapsed time for a CLV disc (or frame number for a CAV disc)
C-6 I-1 1 28 PLAY
Elapsed time for chapter
Index number
This display is skipped when playing a CLV disc.
C-6 25 30 PLAY
Total elapsed time for a CAV disc
C-6 -3 40 PLAY
Remaining time for chapter
5 -22 24 PLAY
Total remaining play time
Remaining chapters on the disc
CDs/CDVs
Track number
Index number
T 5 I-1 1 11 PLAY
Elapsed time for track
T 5 11 19 PLAY
Total elapsed time for the disc
I-5 1 05 PLAY
Remaining time for track
-14 -38 52 PLAY
Total remaining play time
Remaining tracks on the disc

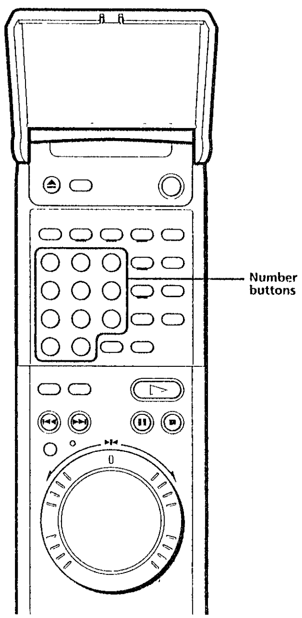
Changing the position of the on-screen indications

You can select the position of the on-screen indications.
If you use a wide-screen TV and some indications on the top or bottom of the screen are invisible, change the position of the on-screen indications using the POSITION button so that you can view the indications.

Each time you press the POSITION button on the remote commander, the position of the on-screen indications changes. There are three other positions.

Additional Operations

Specifying a chapter or track directly (Chapter/Track Search)



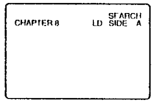
Tip
- In addition to normal play mode, you can do Chapter/Track Search while in Multi Speed, Freeze Frame, Repeat or Pause mode. When the specified chapter or track is located after the search, playback continues in the same mode.

Note
- Chapter Search does not function correctly if the LD does not contain chapter numbers, or if the chapter number entered does not exist.

LDs are divided into sections called "chapters." CDs and CDVs are divided into sections called "tracks." Simply enter the desired chapter/track number to go to a chapter or track and start playing it immediately.

Locating a particular chapter/track

Press one of the number buttons to enter the chapter/track number. The picture freezes and the player goes to the chapter/track you entered, then playback starts.

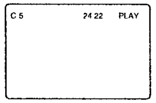


To play a chapter on the opposite side of the LD, press DISC SIDE B (or A), then enter the chapter number.

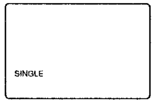
To enter a number greater than 10, press (+10), then one of the ⓪ – ⑨ buttons. If you press (+10) by mistake, press CLEAR, then enter the correct number.

To	Press
Enter 14	(+10) , then ④
Enter 25	(+10) , (+10) , then ⑤
Enter 30	(+10) , (+10) , (+10) , then ⓪

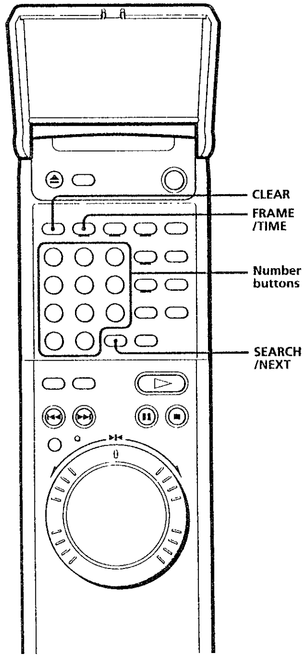
To check the current chapter/track number on the screen
Press DISPLAY to display the chapter/track number.
The number appears in the upper left-hand corner of the screen. If the LD does not contain chapter numbers, no number is displayed.



To play only one chapter/track
Press 1/SIDE/ALL once. "SINGLE" appears briefly.
Enter the chapter/track number using the number buttons.
The chapter or track is played once.



Searching by frame number or time (Frame/Time Search)



Tip
- In addition to normal play mode, you can do Frame/Time Search while in Multi Speed, Freeze Frame, Repeat or Pause mode. When the specified chapter or track is located after the search, playback continues in the same mode.

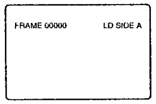
Note
- If you enter a frame/time number which does not exist on the disc, the last scene on the current side of the LD is played.

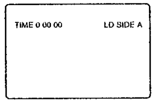
Video scenes are counted as a series of still pictures or "frames." When playing a CAV (standard-play) LD, the player keeps track of the number of frames. So, you can locate a scene on the CAV disc by specifying the frame number. When playing a CLV (extended-play) LD, the player keeps track of the elapsed playing time. So, you can locate a particular point on the CLV LD by specifying the total elapsed time.

Entering the frame number or elapsed time

1 **Press FRAME/TIME.**

When playing	Indication
CAV LD	FRAME 00000
CLV LD	TIME 0:00:00





2 **Enter the multi-digit number corresponding to the frame or time you want to locate.**
To locate frame number 12340 on a CAV LD, press the number buttons in the order, ① , ② , ③ , ④ and ⓪ .

To locate the 12 minutes, 5 second point on a CLV LD, press the number buttons in the order, ① , ② , ⓪ and ⑤ .

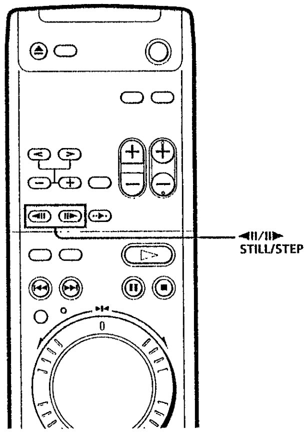
If you enter the wrong number, press FRAME/TIME to clear the number, then enter the correct number.

3 **Press SEARCH/NEXT.**
The picture freezes and the player searches for the frame or time you entered, then playback starts.

To check the frame number or time on the screen
Press DISPLAY.
The current frame number or time is displayed on the screen.

To cancel Frame/Time Search
Press CLEAR before pressing SEARCH/NEXT.

Viewing frame-by-frame action



Tips

- When playing a CDV, press **II** PAUSE instead of ■ STOP to store the picture.
- The player automatically stores the last picture viewed just before you do any of the following operations:
  - You press ■ STOP while playing an LD.
  - You press **II** PAUSE while playing a CLV LD or CDV.
  - You use search functions such as Chapter Search or Frame/Time Search.
  - You do a Scan.
  - You exit Multi Speed or Still/Step mode on a CLV LD or CDV.
  - You exit Multi Speed at × 10 normal speed while playing a CAV LD.
  - You press DISC SIDE A/B or the player automatically changes the disc side.

  Each time you do any of these operations, a new picture is over-written in the digital memory.
- The stored picture is cleared when you turn off the player.

During any scene, you can freeze play into a still picture, and then advance or reverse the action frame-by-frame.

Freezing the action (Freeze Frame)

Press **II** PAUSE or one of the ◀II/II▶ STILL/STEP buttons while playing an LD or CDV.
The sound mutes and the picture freezes.

To resume normal playback
Press ▷ PLAY.

Playing frame-by-frame (Step Play)

1 Press one of the ◀II/II▶ STILL/STEP buttons while playing an LD or CDV.
The sound mutes and the picture freezes.

2 Press ◀II or II▶ repeatedly to advance or reverse the action frame-by-frame.
Hold down ◀II or II▶ to view continuous frame-by-frame action.

To resume normal playback
Press ▷ PLAY.

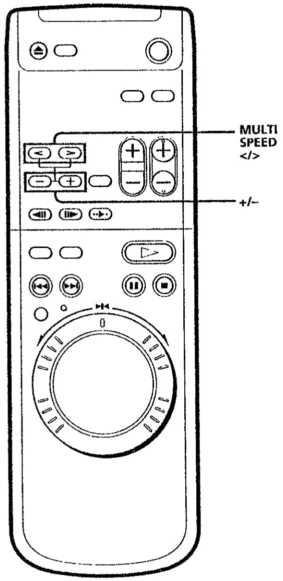
Recalling a picture stored in the digital memory (Picture Call)

You can store and display a picture you like using the digital memory of this player. You can recall the stored picture any time by pressing the PICTURE CALL button, even with no disc loaded or while playing a CD.

1 Press ■ STOP at the point you want to store the picture.
The picture freezes and the picture is stored.
2 You can then replace the disc.
3 Open the remote commander and press PICTURE CALL.
The picture is recalled and displayed on the screen.

To clear the recalled picture from the screen
Press PICTURE CALL again.
Each time you press PICTURE CALL, the stored picture is turned on/off.

Viewing at varying speeds (Variable Speed Play)



Notes

- The sound mutes except when playing at normal (×1) speed.
- If an automatic picture stop code (found on educational discs) is encountered during ×1 or less variable speed play, the unit automatically stops at that frame. To resume playback, press ▷ PLAY, MULTI SPEED (< or >), or rotate the SHUTTLE ring.

You can find a scene by playing a disc forward or in reverse at varying speeds. There are two ways: using the MULTI SPEED </> and +/– buttons, or using the JOG/SHUTTLE ring.

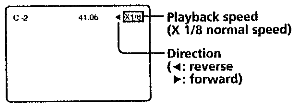
Using the MULTI SPEED </> and +/– buttons

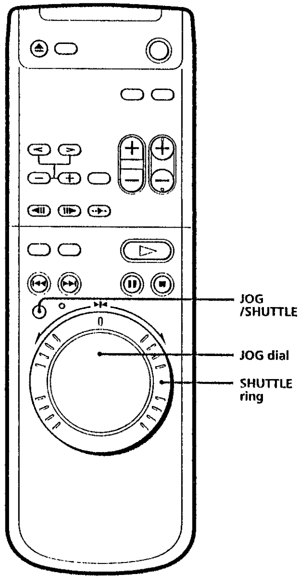
1 Press MULTI SPEED < or > while playing an LD or CDV to select the direction.
Reverse: <
Forward: >
The playing speed and direction appear on the screen.

2 Press + or – to select the speed.
To reduce speed: –
To increase speed: +

To resume normal playback
Press ▷ PLAY.

To check the direction and speed of playback
Press DISPLAY.



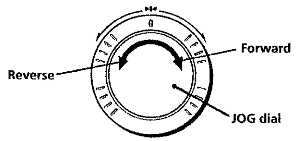

JOG /SHUTTLE
JOG dial
SHUTTLE ring

Notes
- When the JOG/SHUTTLE indicator is not lit, the JOG dial does not operate.
- If you rotate the SHUTTLE ring when the JOG/SHUTTLE indicator is not lit, the disc is scanned at about ×10 or ×30 the normal speed.

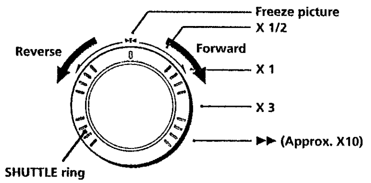
Using the JOG/SHUTTLE ring

1 **Press the JOG/SHUTTLE button.**
The indicator beside the button lights up and the frame freezes.

2 **Rotate the JOG dial or the SHUTTLE ring.**
When rotating the JOG dial:
Frames go forward or in reverse as you rotate the JOG dial. Playing speed varies from frame-by-frame to normal speed corresponding to the speed you rotate the dial.

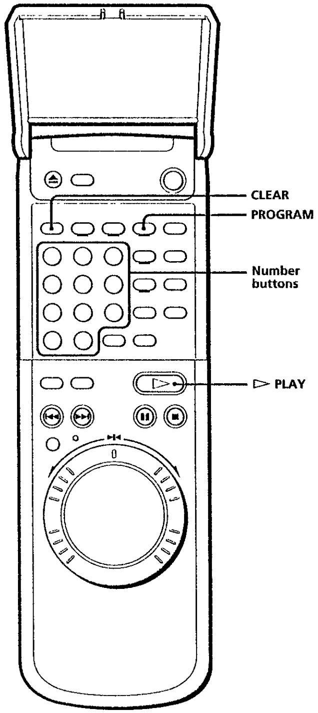

Forward
Reverse
JOG dial

When rotating the SHUTTLE ring:
The direction and speed of playback corresponds to the degree you rotate the SHUTTLE ring. The illustration below shows you the approximate positions of each speed (positions are the same for both directions).


Freeze picture
X 1/2
Reverse
Forward
X 1
X 3
►► (Approx. X10)
SHUTTLE ring

To resume normal playback
Press ▷ PLAY.
Press the JOG/SHUTTLE button to turn off the JOG/SHUTTLE indicator.

Playing in a specified order (Program Play)

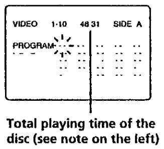

CLEAR
PROGRAM
Number buttons
▷ PLAY

Note
- Total playing time of the disc appears when the player has read TOC data of the disc. To make the player read TOC data of an LD, see "Checking the total playing time of the program" on page **23**.

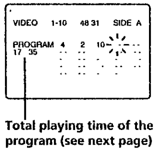
You can specify up to 25 chapters or tracks on a disc to be played in any order you like, regardless of disc side, even while the disc is being played. The chapters/tracks are played continuously in the order you specify.

Specifying chapters/tracks

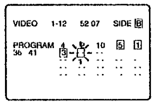
1 **Press PROGRAM.**
"PROGRAM" appears on the screen.
"PGM" flashes in the front panel display.


VIDEO 1-10 48 31 SIDE A
PROGRAM
Total playing time of the disc (see note on the left)

2 **Press the number buttons to specify chapters on the current disc side, or tracks on a CD or CDV, in the order you want them to play.**
If you enter a wrong number, press CLEAR. With each press, the last chapter/track you entered is deleted.


VIDEO 1-10 48 31 SIDE A
PROGRAM 4 2 10
17 35
Total playing time of the program (see next page)

3 **To enter chapters from the other disc side, press DISC SIDE B (or A), then press the number buttons to specify the chapters in the order you want them to play.**


VIDEO 1-12 52 07 SIDE B
PROGRAM 4 10 5 1
36 41 3

4 **Repeat steps 2 (and 3) until you finish specifying chapters/tracks.**

5 **Press ▷ PLAY.**
On-screen indications disappear and the program you made starts playing.
"PGM" on the front panel display stops flashing and lights up.

To change an entry (while "PGM" is flashing in the front panel)
Press SEARCH/NEXT or BACK repeatedly until the number you want to change flashes on the screen, then enter the correct number. If "PGM" is not flashing in the front panel display, press PGM to make the sign "PGM" flash, then use SEARCH/NEXT or BACK.

To clear all the entries together
Press CLEAR while "PGM" is flashing in the front panel display. If "PGM" is not flashing in the front panel display, press PROGRAM to make the sign "PGM" flash, then press CLEAR.

To make a new program
Clear all the entries, then press PROGRAM and specify chapters/tracks from the beginning.

To enter a number greater than 10
Press (+10), then one of the number buttons. If you press (+10) by mistake, press (+10) repeatedly until "– –" flashes, then enter the correct number.

To	Press
Enter 15	(+10), then ⑤
Enter 30	(+10), (+10), (+10), then ⓪

Checking the total playing time of the program

When you make a program on a CD or CDV, the total playing time of the program is always displayed on the screen and front panel display. If you want to check the total playing time while specifying chapters on an LD, you must make the player read TOC data of the LD following the procedures below before you start programming.

1 Press QUICK START on the player to turn off the indicator while the player is stopped.
2 Press ▷ PLAY.
The player starts playing the disc and reads TOC data from side A. The AV calendar on side A appears on the front panel display.
If you also want to select chapters on side B, press DISC SIDE B.
The player starts playing side B and reads TOC data from side B.
The AV calendar on side B appears on the front panel display.

Now you can make a program while viewing its total playing time.

Note
- The total playing time of the program is not available with LDs not containing TOC data, even if you turn off the Quick Start function.

If you enter II PAUSEs in the program
You can enter II PAUSEs among chapter/tracks you specify, to make the player automatically pause during playback of the program. If you enter a II PAUSE, the total playing time is re-counted from --:-- (zero).

To check the contents of the program
Press DISPLAY twice while playing the program.
The numbers of programed chapters/tracks appear on the screen. The flashing number indicates the chapter/track currently being played.

To skip chapters/tracks while playing the program
Press I◀◀/▶▶I ACS/AMS.
Each time you press I◀◀/▶▶I ACS/AMS, the player skips one chapter/track within the program.

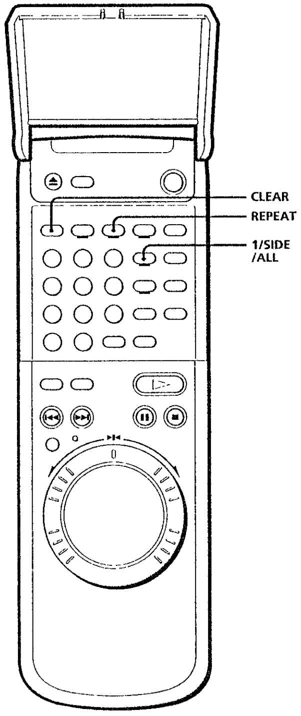
To play the program repeatedly
Press REPEAT.
"REPEAT" appears on the screen briefly and the player plays the program repeatedly.

Canceling program play

Press CLEAR.
The player resumes normal playback from the current chapter/track.

Tips
- You can advance to forward chapters/tracks in the program by rotating the SHUTTLE ring clockwise. However, you can not go back to previous chapters/tracks by rotating the SHUTTLE ring counterclockwise.
- The program you made is not cleared even after canceling program play. Press PROGRAM to enter the program mode, then press ▷ PLAY. You can play the same program again.
- The program is cleared when:
  - you press clear while "PGM" is flashing in the front panel display.
  - you press ≙ OPEN/CLOSE.
  - you turn off the player.

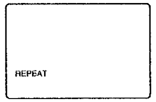
Playing a section repeatedly (Repeat Play)



Repeat play allows you to play the disc over and over. You can replay both sides, a single side or one chapter of an LD, and a whole disc or a single track on a CD, or a portion you specified on the disc.

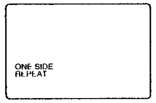
Repeating the whole disc (All Disc Repeat)

Press REPEAT.
"REPEAT" appears on the screen briefly. "REPEAT" lights up on the front panel display. When playing an LD, the player plays through both sides of the LD repeatedly. When playing a CD or CDV, the player plays all the tracks on the disc repeatedly.



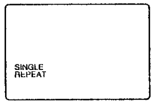
Repeating the selected side of the LD (One Side Repeat)

Press 1/SIDE/ALL twice, then press REPEAT.
"ONE SIDE" and "REPEAT" appear on the screen briefly. "REPEAT 1 SIDE" lights up on the front panel display. The player plays the selected disc side repeatedly.



Repeating the selected chapter/track (Single Repeat)

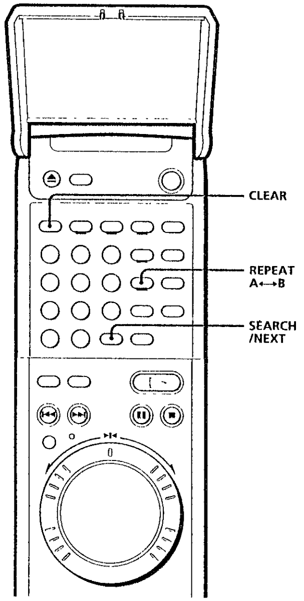
Press 1/SIDE/ALL once, then press REPEAT.
"SINGLE" and "REPEAT" appear on the screen briefly. "REPEAT 1" lights up on the front panel display. The player plays the selected chapter/track repeatedly.



To check the repeat status
Press DISPLAY twice.

Canceling Repeat Play

Press CLEAR.



Notes
- When you play an LD, you can do Repeat A↔B only on the current side of the LD. You cannot do it on both sides of the LD.
- Memory Search is canceled when:
  - you open the disc tray.
  - you turn off the player.
  - you do a Frame/Time Search.

Tips
- You can scan the disc between points A and B by rotating the SHUTTLE ring or holding down ◀◀/▶▶ SCAN.
- Even if you press ■ STOP (but not POWER or ≜ OPEN/CLOSE), the player remembers the "return to" point for Memory Search. If you resume playing by pressing SEARCH/NEXT instead of ▷ PLAY, you can continue to repeatedly return to the point you have selected.

Repeating a specific portion on the disc (Repeat A ↔ B)

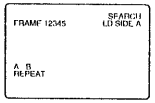
1 Press REPEAT A↔B at the beginning of the scene or phrase you want to repeat.

This tells the player where repeat is to start. "REPEAT" and "A-" appear, "B" flashes on the screen.

2 Let the player run to the end of the scene or phrase.

3 Press REPEAT A↔B again.

This tells the player where repeat is to end. "REPEAT" and "A-B" appear. The player repeatedly plays the scenes or phrases between the two points you specified.



To repeat a different portion

Repeat steps 1 to 3 to reenter new start and end points.

To cancel Repeat A↔B

Press CLEAR.

Repeatedly returning to a specific point on the disc (Memory Search)

1 Press REPEAT A↔B at the point where you want to return to.

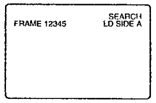
This tells the player where to start. "REPEAT" and "A-" appear, and "B" flashes on the screen.

2 Press CLEAR to turn off the indication "A-B REPEAT" on the screen.

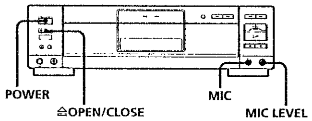
(Thus not setting an end point of "Repeat A↔B.)

3 Press SEARCH/NEXT at any point you like on the disc.

The player returns to the point you specified and starts playing.



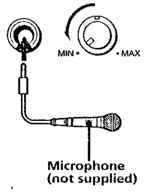
Playing karaoke



This section gives you short instructions for playing "karaoke" (singing along with a disc).

Starting karaoke

1 Set the MIC LEVEL control on the player to MIN, then plug a microphone into the MIC jack.



2 Press POWER to turn on the player.

3 Turn on the TV and stereo system.

TV:

Set to "Video."

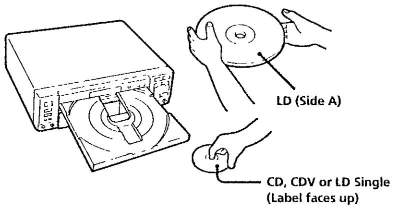
Stereo system:

Turn on the amplifier or receiver and select CD or AUX for audio output.

4 Press ≜ OPEN/CLOSE.

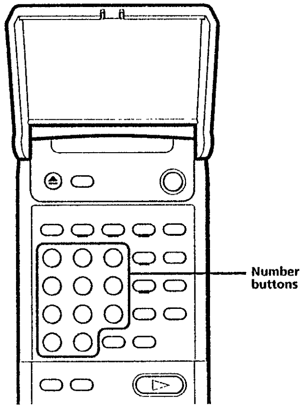
The disc tray comes out.

5 Place a disc on the disc tray.



Place only one disc on the tray, carefully fitting it in the circle on the tray.

Notes
- If you insert more than one disc, or if the disc is not seated properly, the disc may not start playing, and may damage the disc or player.
- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B," regardless of the label "A" or "B" printed on the disc.



Tips
- If howling occurs
  - Move the microphone away from the speakers.
  - Lower the microphone volume or echo level.
  - Lower the volume.
- If the sound is distorted or the picture flickers when listening through your TV speakers, set the ATT switch at the rear of the player to ON to lower the output level.
- Program Play gives you non-stop karaoke entertainment (see "Playing in a specified order" on page 22).

Note
- Use the ANALOG/CX or AUDIO MONITOR button to select the sound. When you play MULTI AUDIO karaoke LDs, the player automatically outputs the backup sound without vocals. Use the ANALOG/CX button to listen to the original vocals recorded in analog tracks. If you use other types of discs such as multiplex karaoke CDs, use the AUDIO MONITOR button to select whether to output only the backup sound or sound with the original vocals (see "Using the sound control functions" on page **14**).

6 Press one of the number buttons on the remote commander to choose the song you want to play.
The disc tray automatically closes and the song starts playing. To choose a song on side B of the LD, press DISC SIDE B, then press the number button.

7 Set the ON/OFF switch on the microphone to ON and turn the MIC LEVEL control to adjust the microphone volume.

(Inner knob)

8 Turn the ECHO control to adjust the strength of echo.

(Outer knob)

Now you can enjoy playing karaoke.

To enter a number greater than 10

To	Press
Enter 14	(+10), then ④
Enter 25	(+10), (+10), then ⑤
Enter 30	(+10), (+10), (+10), then ⓪

Optical discs

The MDP-650 can play all three types of optical discs currently available for home entertainment, laser discs (LD, recorded in NTSC standard), compact discs (CD) and compact disc videos (CDV).*

Disc class	Disc logo	Disc type	Size	Sides	Play time	
Laser Discs For movies, operas, and concerts	LASER DISC	LD Single	8 in. (20 cm)	Single	CAV	14 min
					CLV	20 min
		8-inch LD	8 in. (20 cm)	Double	CAV	28 min
					CLV	40 min
		12-inch LD	12 in. (30 cm)	Double	CAV	1 hr
					CLV	2 hr
Compact Discs For music	COMPACT DISC DIGITAL AUDIO	CD Single	3 in. (8 cm)	Single	20 min	
		CD	5 in. (12 cm)	Single	74 min	
Compact Disc Videos For music videos and educational material (Digital Audio)	CD VIDEO	CDV	5 in. (12 cm)	Single	Video+Audio 5 min Audio 20 min	
	VIDEO SINGLE DISC	VSD	5 in. (12 cm)	Single	Video+Audio 5 min	

Multi audio discs

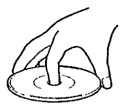
digital AUDIO MULTI AUDIO

Discs with these logos contain separate analog and digital tracks which may differ in content.

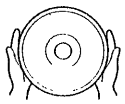
* The MDP-650 cannot play the following discs or functions:
- CED, VHD discs or PAL video discs
- CD-ROM, CD-GRAPHICS, VIDEO CD, Photo CD, CD-I discs
- Aluminum-lined discs or MD (MiniDisc) discs
- Graphic functions of LD-G discs

Optical disc maintenance

Holding CDs or CDVs
Hold CDs or CDVs by putting your index finger through the center hole and grasping the edge of the disc with the thumb and other fingers as shown in the illustration.



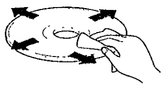
Holding LDs
Hold LDs by grasping the outside edge with both hands as illustrated.

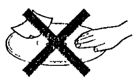


Light exposure
Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave the disc in a car parked in direct sunlight where there can be a considerable rise in temperature.

Cracked or damaged discs
Do not play cracked or damaged discs, or try to play discs that have been repaired with adhesive glues.

Keeping the disc surface clean
Clean the surface of the disc before playing, using a soft, dry, cleaning cloth. Wipe the disc from the center out. Do not use solvents such as benzine, paint thinner, commercially available cleaners, or anti-static spray intended for LP record discs.
To prevent marring, after playing, remove the disc and put it back into its jacket.
Putting your fingers on, or adhering anything to the surface of the disc such as sticky note pad paper or adhesive tape will deteriorate the quality of the playing surface, and thus the output quality.

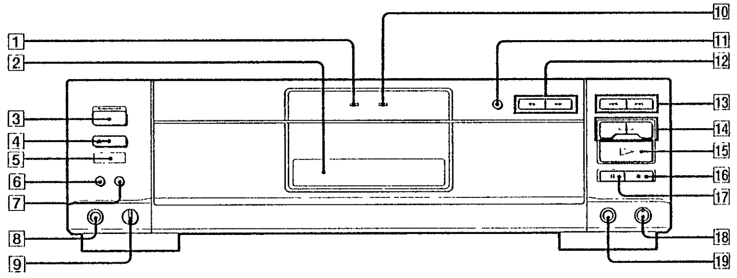




Index to parts and controls

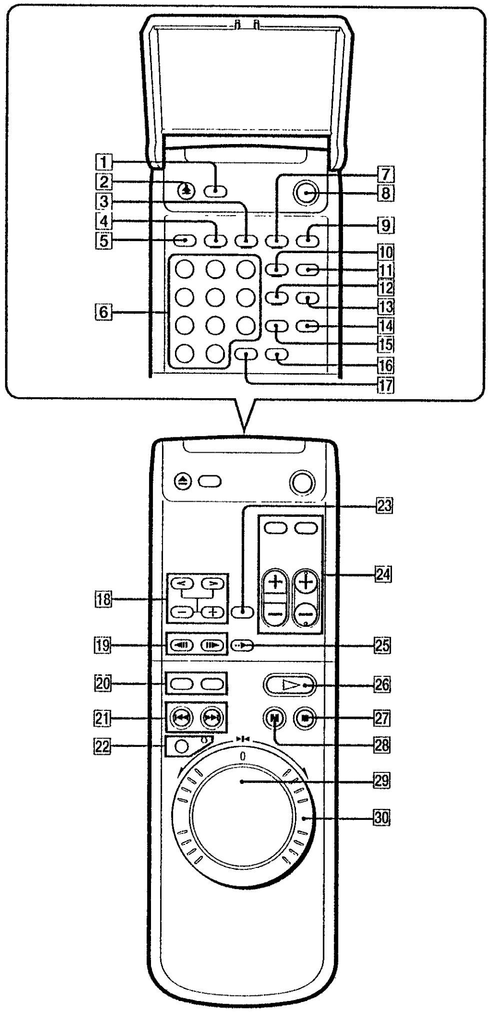
See the pages indicated in ( ) for details.

Front



- [1] LD DIGEST indicator (12)
- [2] Front panel display (9)
- [3] POWER switch and indicator (8)
  - ON: Green
  - OFF: Off
- [4] ≙ OPEN/CLOSE button (8)
- [5] Remote sensor (28)
- [6] QUICK START button and indicator (11)
- [7] FL DISPLAY button (9)
- [8] PHONES jack (9)
- [9] LEVEL control (9)
- [10] AUTO RESUME indicator (10)
- [11] THEATER MODE button and indicator (12)
- [12] ◀◀/▶▶ SCAN buttons (13)
- [13] ⏮/⏭ ACS/AMS buttons (13)
- [14] SIDE A/B buttons and indicators (9)
- [15] ▷ (Play) button (8)
- [16] ■ (Stop) button (8)
- [17] ❚❚ (Pause) button (8)
- [18] ECHO/MIC LEVEL controls (26)
- [19] MIC jack (26)

Remote commander

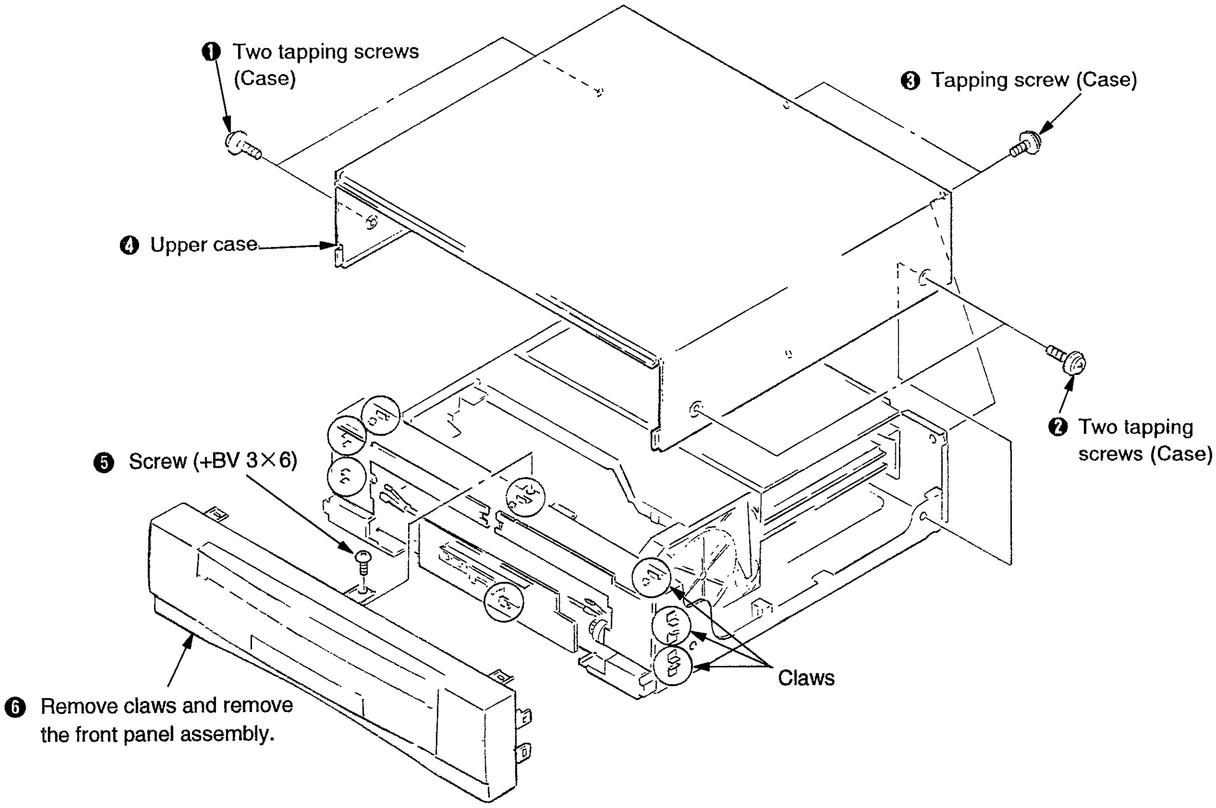


1 DISPLAY button (15)
2 ≜ OPEN/CLOSE button (8)
3 REPEAT button (24)
4 FRAME/TIME button (18)
5 CLEAR button (18) (22) (24)
6 Number buttons (17) (18) (22) (27)
7 PROGRAM button (22)
8 POWER switch (8)
9 ANALOG/▢☒ button (14)
10 1/SIDE/ALL button (9) (17) (24)
11 AUDIO MONITOR button (14)
12 REPEAT A←→B button (25)
13 AV TIME button (16)
14 POSITION button (16)
15 PICTURE CALL button (19)
16 BACK button (22)
17 SEARCH/NEXT button (18) (22) (25)
18 MULTI SPEED </>, +/– buttons (20)
19 ◀II/II▶ STILL/STEP buttons (19)
20 DISC SIDE A/B buttons (9)
21 I◀◀ /▶▶I ACS/AMS buttons (13)
22 JOG/SHUTTLE button and indicator (21)
23 THEATER MODE button (12)
24 TV control buttons (available for TVs which have ☒ mark)
25 ••▶•LD DIGEST button (12)
26 ▷ PLAY button (8)
27 ■ STOP button (8)
28 II PAUSE button (8)
29 JOG dial (21)
30 SHUTTLE ring (13) (21)

- A function activated by pressing a button with an orange mark (illustrated as " ⊂⊃ ") can be canceled by pressing the CLEAR button.
- Buttons illustrated as " ⊂⊃ " are "Illuminated buttons," which are easy to locate under poor light conditions.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF FRONT PANEL ASSEMBLY



❶ Two tapping screws (Case)

❷ Two tapping screws (Case)

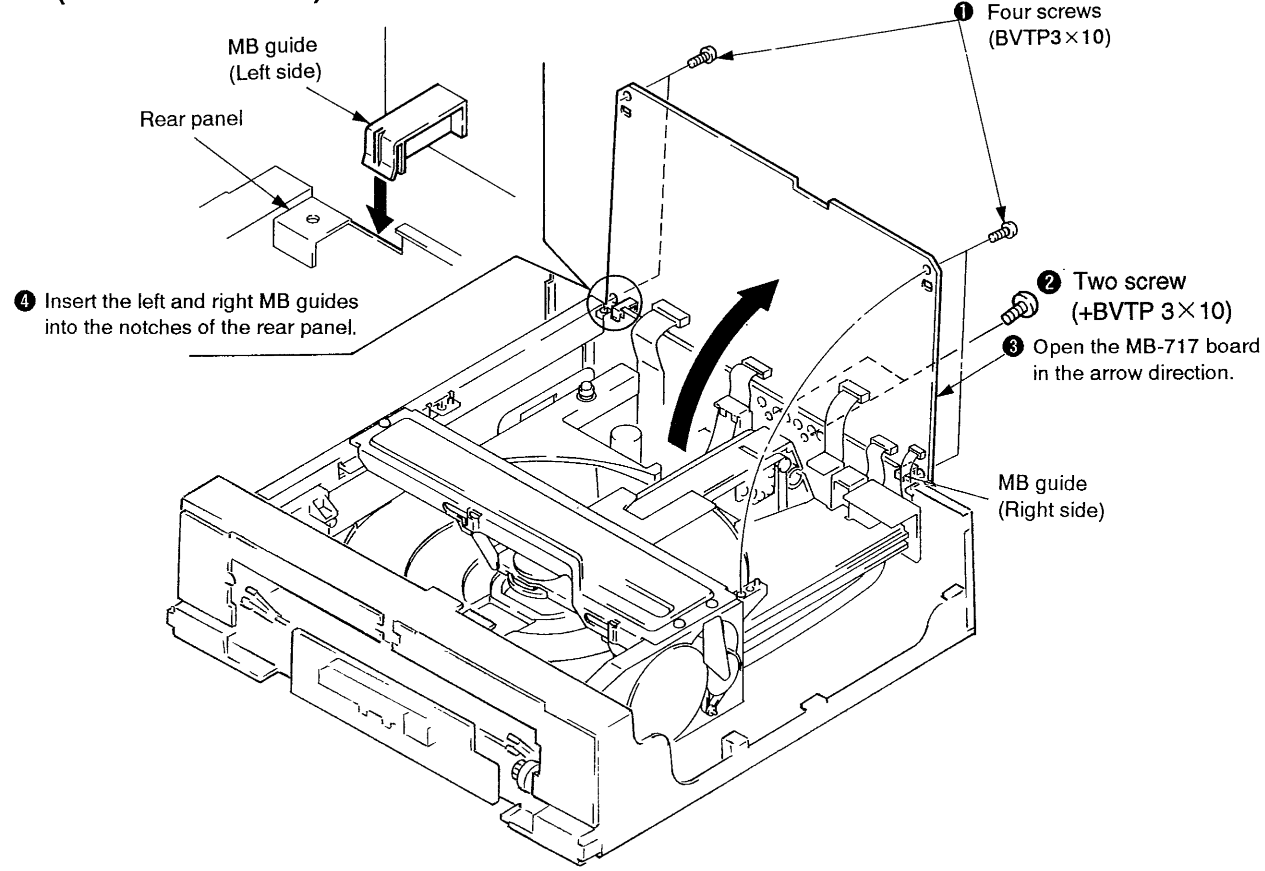
❸ Tapping screw (Case)

❹ Upper case

❺ Screw (+BV 3×6)

❻ Remove claws and remove the front panel assembly.

2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)



❶ Four screws (BVTP3×10)

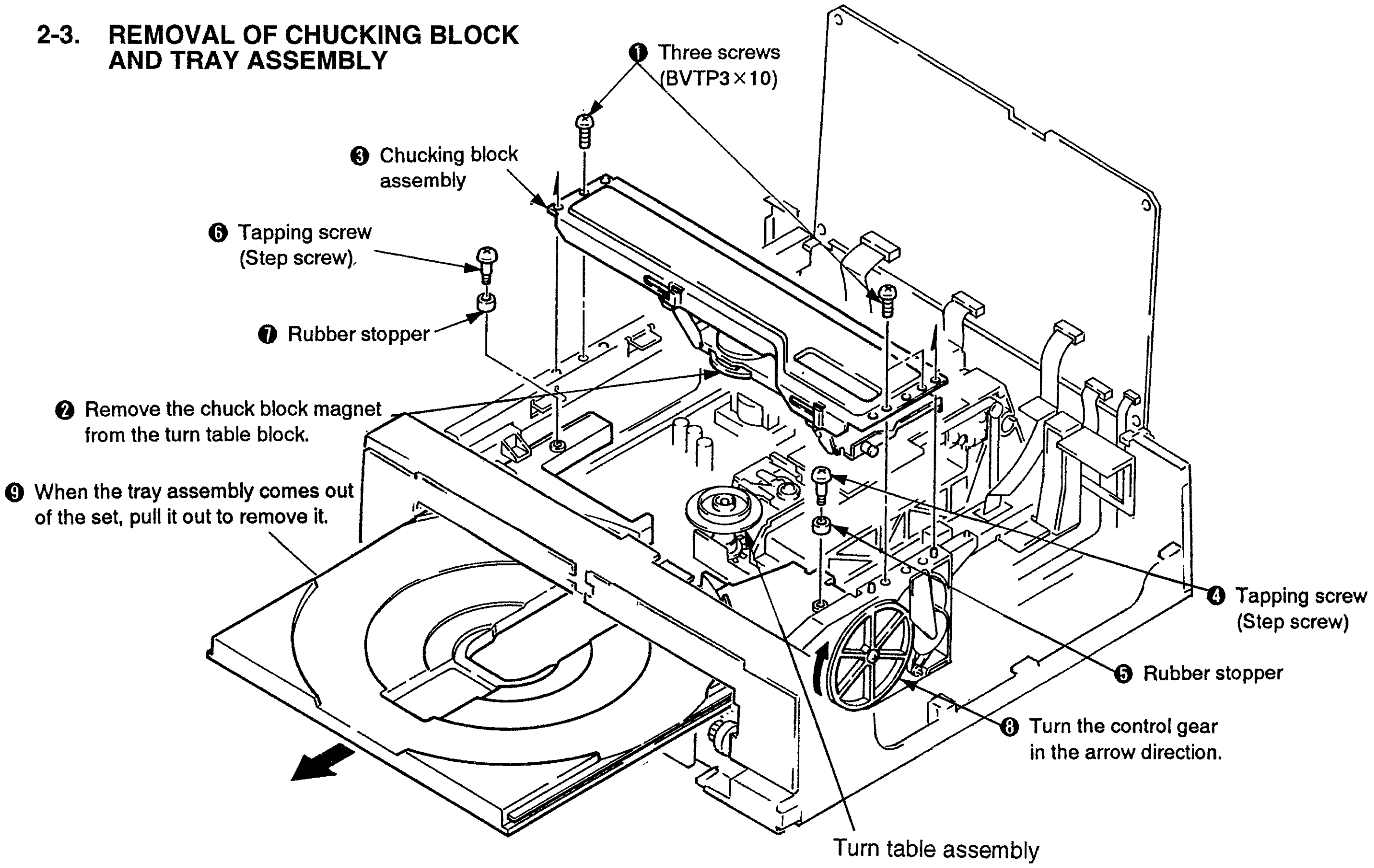
❷ Two screw (+BVTP 3×10)

❸ Open the MB-717 board in the arrow direction.

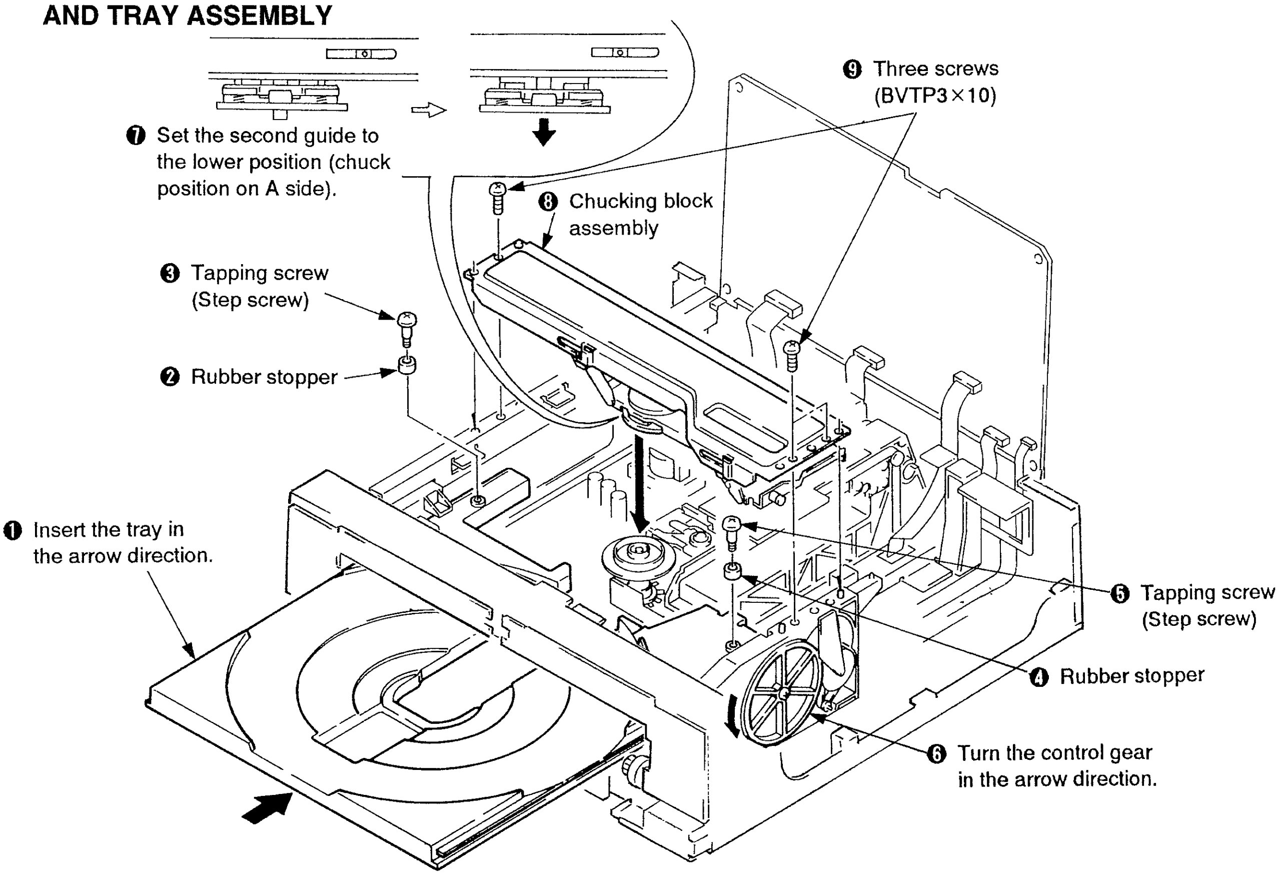
❹ Insert the left and right MB guides into the notches of the rear panel.

MB guide (Left side)
Rear panel
MB guide (Right side)

2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY

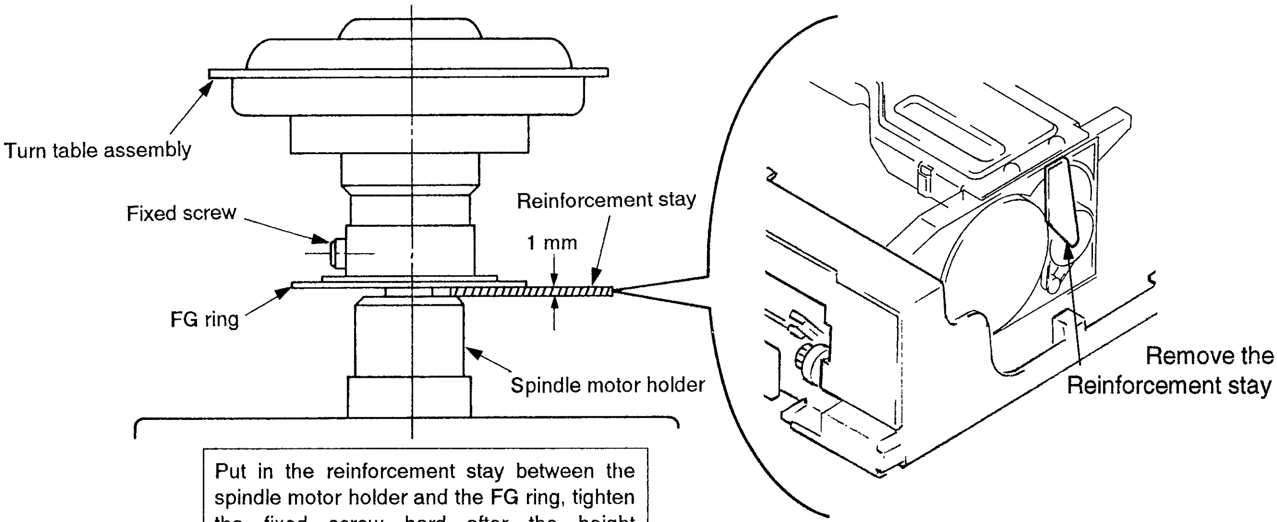

❶ Three screws (BVTP3×10)
❸ Chucking block assembly
❻ Tapping screw (Step screw)
❼ Rubber stopper
❷ Remove the chuck block magnet from the turn table block.
❾ When the tray assembly comes out of the set, pull it out to remove it.
❹ Tapping screw (Step screw)
❺ Rubber stopper
❽ Turn the control gear in the arrow direction.
Turn table assembly

2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY


❾ Three screws (BVTP3×10)
❼ Set the second guide to the lower position (chuck position on A side).
❽ Chucking block assembly
❸ Tapping screw (Step screw)
❷ Rubber stopper
❶ Insert the tray in the arrow direction.
❺ Tapping screw (Step screw)
❹ Rubber stopper
❻ Turn the control gear in the arrow direction.

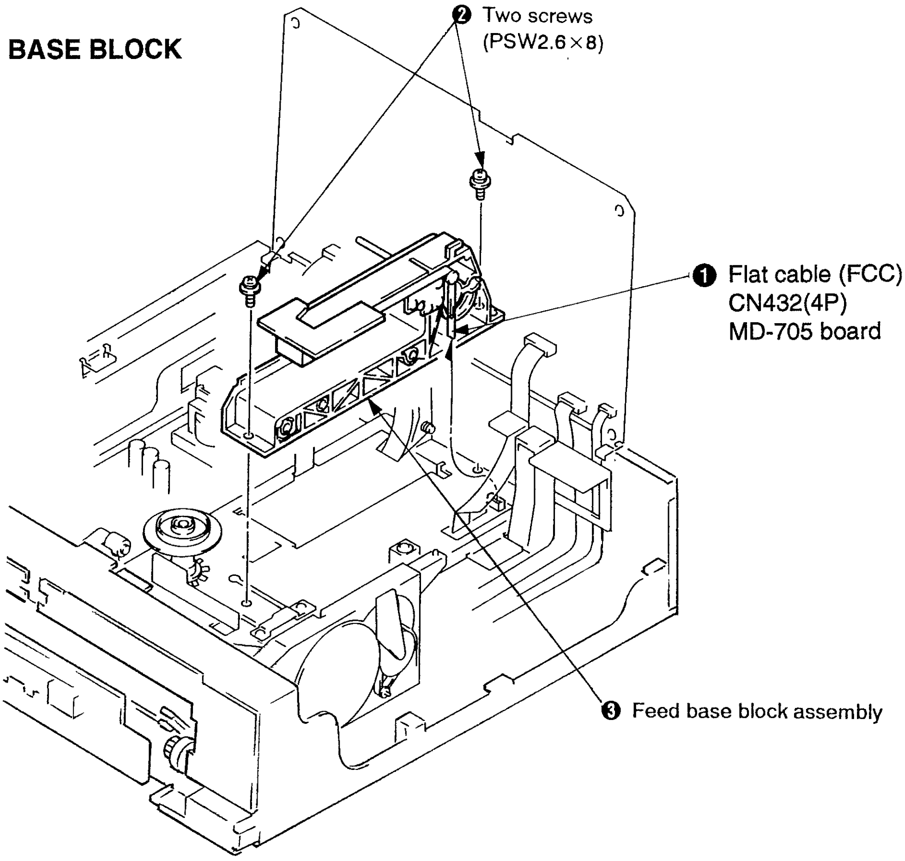
2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY

1. Rotate the control gear on the right side of the set, and open the tray.
2. Remove the chucking block assembly.
3. Remove the reinforcement stay.
4. Change the turn table assembly.
   Adjust the height and also the position putting in the reinforcement stay as below. The thickness of the reinforcement is 1 mm.
5. Fix the reinforcement to fixed position.

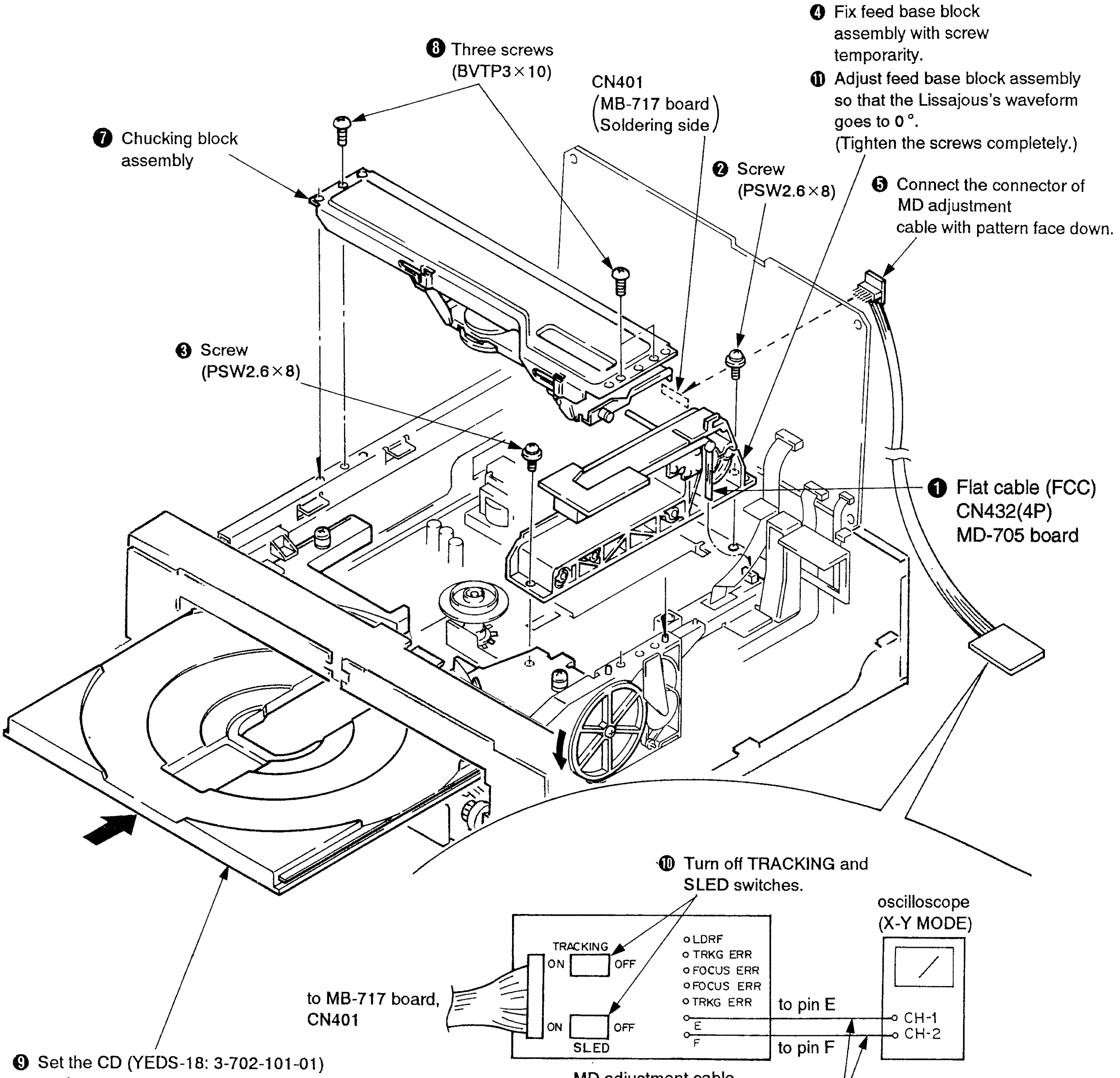

Turn table assembly
Fixed screw
FG ring
Reinforcement stay
1 mm
Spindle motor holder
Remove the Reinforcement stay

Put in the reinforcement stay between the spindle motor holder and the FG ring, tighten the fixed screw hard after the height adjustment.

2-6. REMOVAL OF FEED BASE BLOCK ASSEMBLY


❷ Two screws (PSW2.6×8)
❶ Flat cable (FCC) CN432(4P) MD-705 board
❸ Feed base block assembly

2-7. MOUNTING THE FEED BASE BLOCK ASSEMBLY


CN401
(MB-717 board Soldering side)
Flat cable (FCC) CN432(4P) MD-705 board
TRACKING
ON
OFF
ON
OFF
SLED
o LDRF
o TRKG ERR
o FOCUS ERR
o FOCUS ERR
o TRKG ERR
E
F
to pin E
to pin F
CH-1
CH-2
oscilloscope (X-Y MODE)
to MB-717 board, CN401
MD adjustment cable (J-6082-059-B)

❶ Flat cable (FCC) CN432(4P) MD-705 board

❷ Screw (PSW2.6×8)

❸ Screw (PSW2.6×8)

❹ Fix feed base block assembly with screw temporarity.

❺ Connect the connector of MD adjustment cable with pattern face down.

❻ Connect CH-1 to pin E and CH-2 to pin F.

❼ Chucking block assembly

❽ Three screws (BVTP3×10)

❾ Set the CD (YEDS-18: 3-702-101-01) on the tray.
Press the PLAY (▶) button and plays the track No. 1 set PAUSE.

❿ Turn off TRACKING and SLED switches.

⓫ Adjust feed base block assembly so that the Lissajous's waveform goes to 0°.
(Tighten the screws completely.)

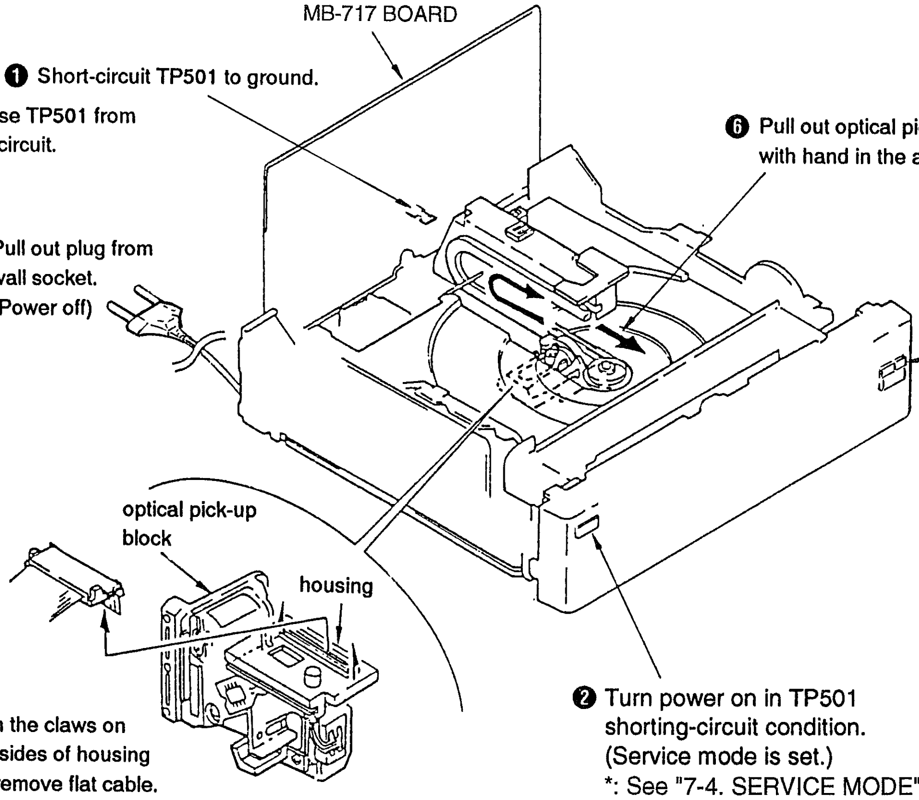
⓬ Refer to 7-10. Adjustment after the attachment of the optical pick-up block. (Page:7-14)

Lissajous's waveform

× × ○
180° 90° 0°
＼ ○ ／

2-8. OPTICAL PICK-UP BLOCK

- **DISASSEMBLE I**
  (OPTICAL PICK-UP BLOCK MOTOR OPERATES)



❶ Short-circuit TP501 to ground.

❷ Turn power on in TP501 shorting-circuit condition. (Service mode is set.)
*: See "7-4. SERVICE MODE" on page 7-2 for the service mode.

❸ Release TP501 from short-circuit.

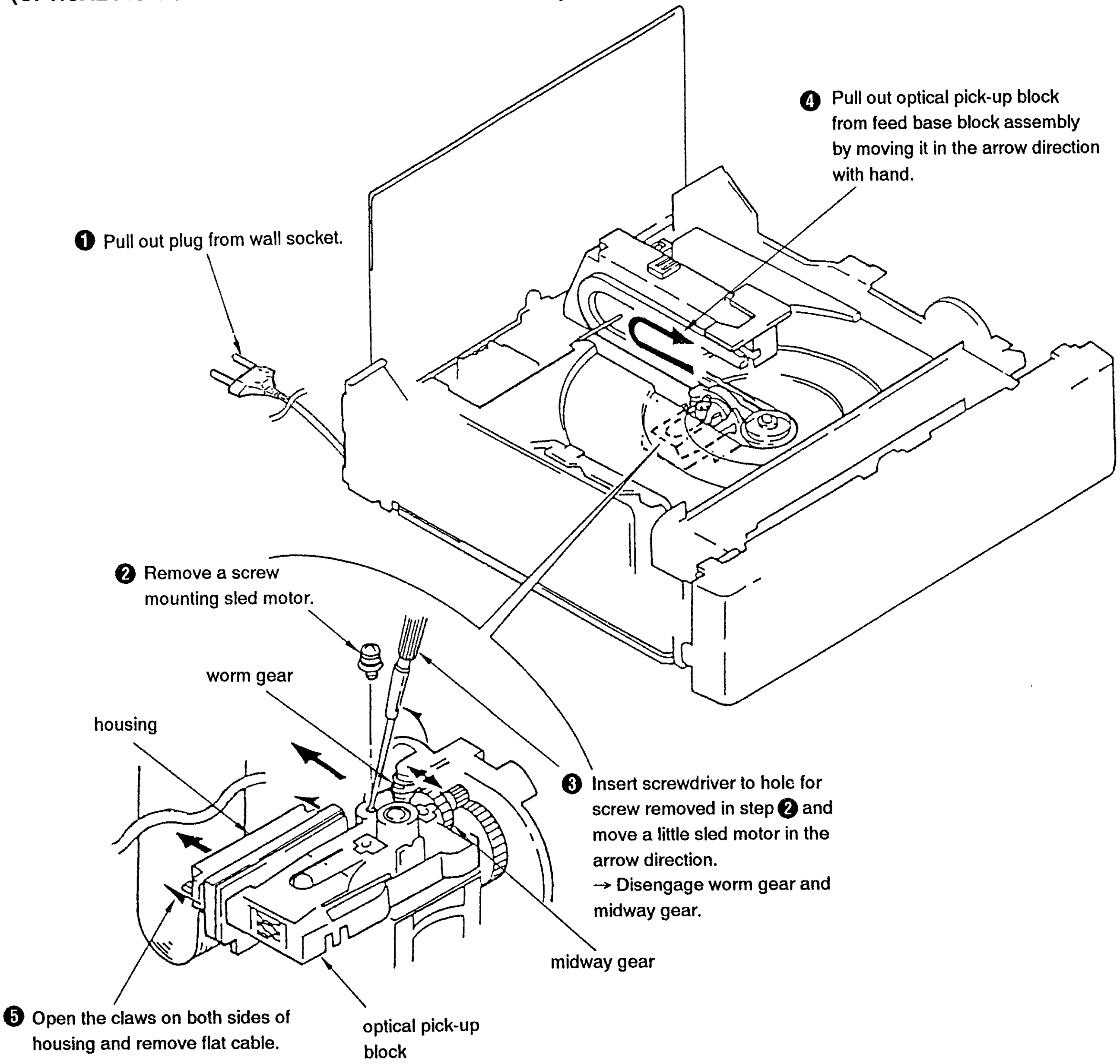
❹ Keep pushing SIDE B button to move optical pick-up block to upper and front side.

❺ Pull out plug from wall socket. (Power off)

❻ Pull out optical pick-up block with hand in the arrow direction.

❼ Open the claws on both sides of housing and remove flat cable.

• DISASSEMBLE Ⅱ
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)



❶ Pull out plug from wall socket.

❷ Remove a screw mounting sled motor.

❸ Insert screwdriver to hole for screw removed in step ❷ and move a little sled motor in the arrow direction.
→ Disengage worm gear and midway gear.

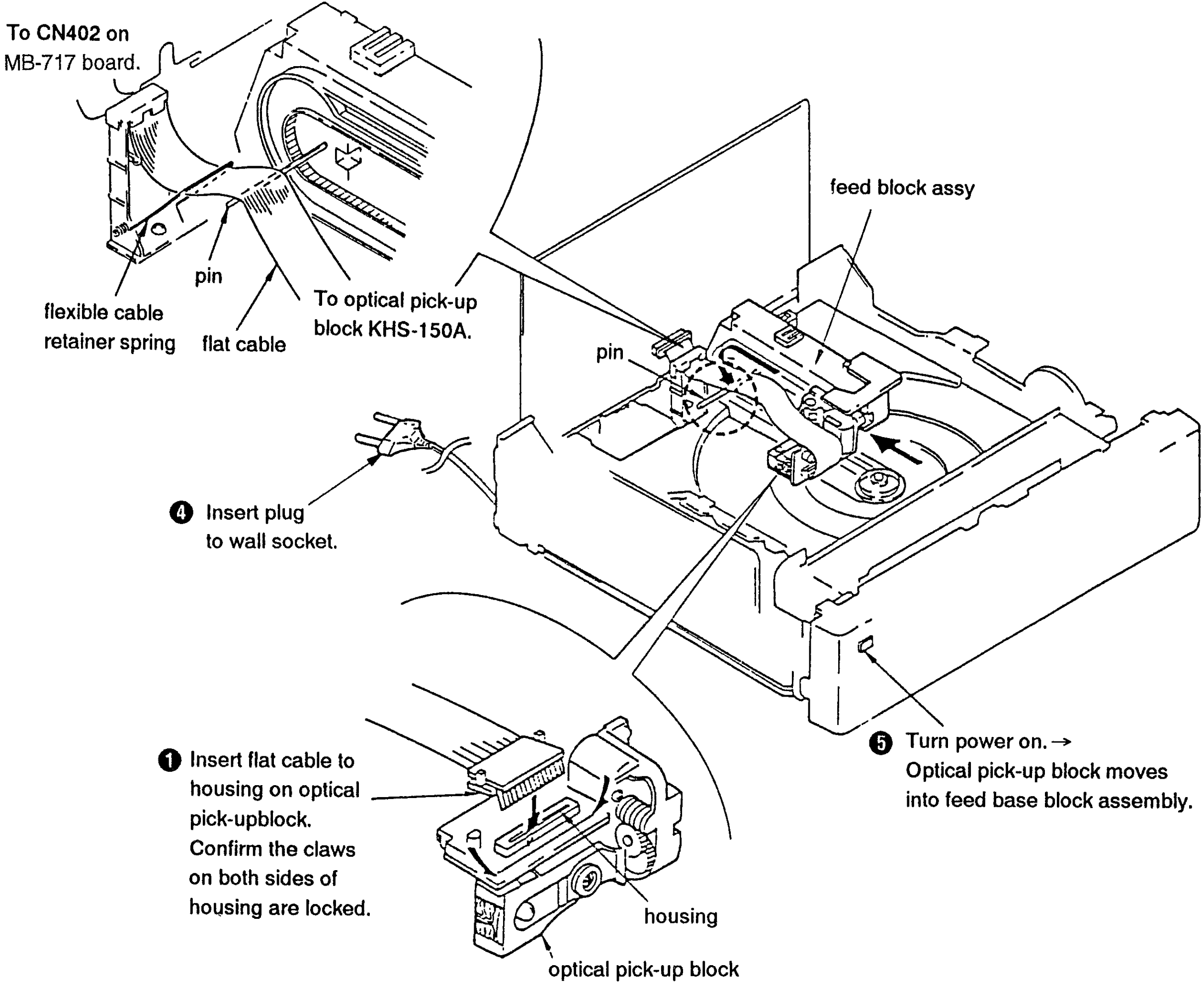
❹ Pull out optical pick-up block from feed base block assembly by moving it in the arrow direction with hand.

❺ Open the claws on both sides of housing and remove flat cable.

worm gear
housing
midway gear
optical pick-up block

• ASSEMBLE

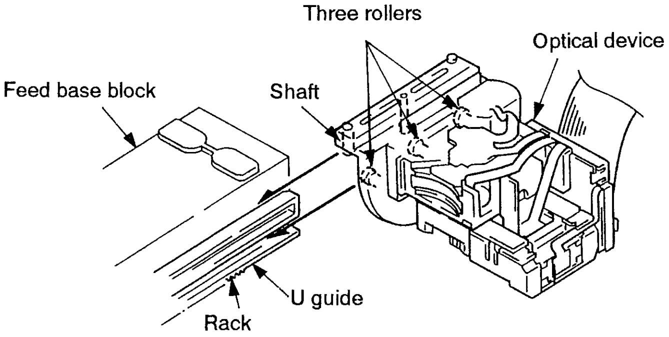
❸ Confirm the flat cable goes through the flexible cable retainer spring and over the pin.


To CN402 on MB-717 board.
pin
flexible cable retainer spring
flat cable
To optical pick-up block KHS-150A.
feed block assy
pin
housing
optical pick-up block

❹ Insert plug to wall socket.

❶ Insert flat cable to housing on optical pick-upblock. Confirm the claws on both sides of housing are locked.

❺ Turn power on.→ Optical pick-up block moves into feed base block assembly.


Three rollers
Optical device
Feed base block
Shaft
U guide
Rack

❷ Insert optical pick-up block to feed base block assembly.

- Mounting

1) Insert the shaft and three rollers of the optical device into their corresponding grooves of the U guide.
2) Set so that the gear of the optical device engages with the rack of the U guide.

2-9. REMOVAL OF CONTROL GEAR

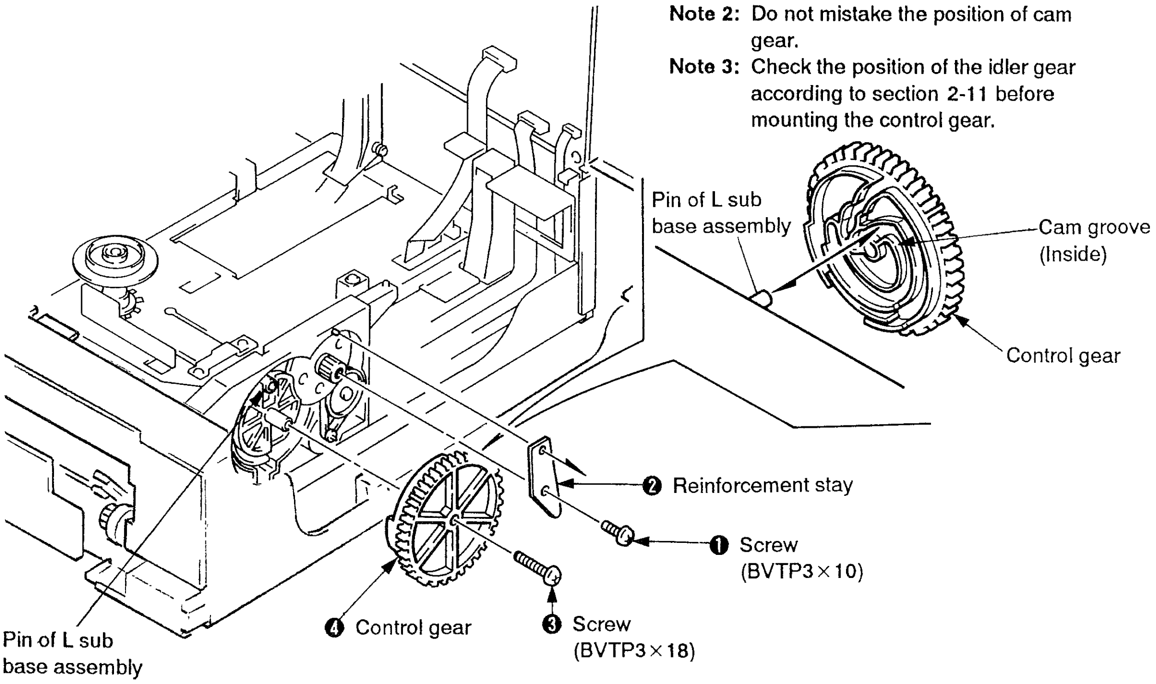
- Mounting the control gear

Lower the pin of the L sub base assembly completely and insert the pin into the cam groove (inside) of the control gear.

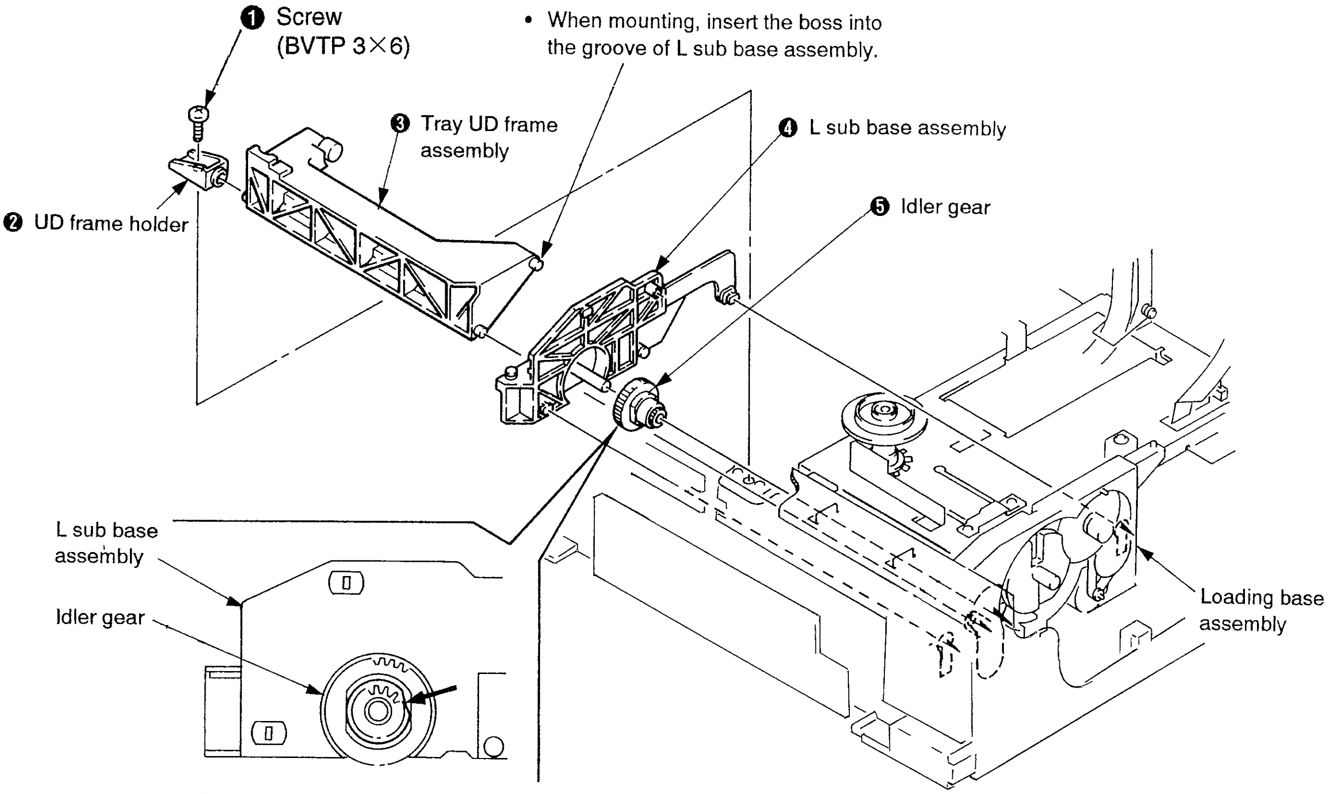
Note 1: Apply grease on the cam groove.

Note 2: Do not mistake the position of cam gear.

Note 3: Check the position of the idler gear according to section 2-11 before mounting the control gear.


Pin of L sub base assembly
Cam groove (Inside)
Control gear
❷ Reinforcement stay
❶ Screw (BVTP3×10)
❺ Pin of L sub base assembly
❹ Control gear
❸ Screw (BVTP3×18)

2-10. REMOVAL OF IDLER GEAR



- When mounting, insert the boss into the groove of L sub base assembly.

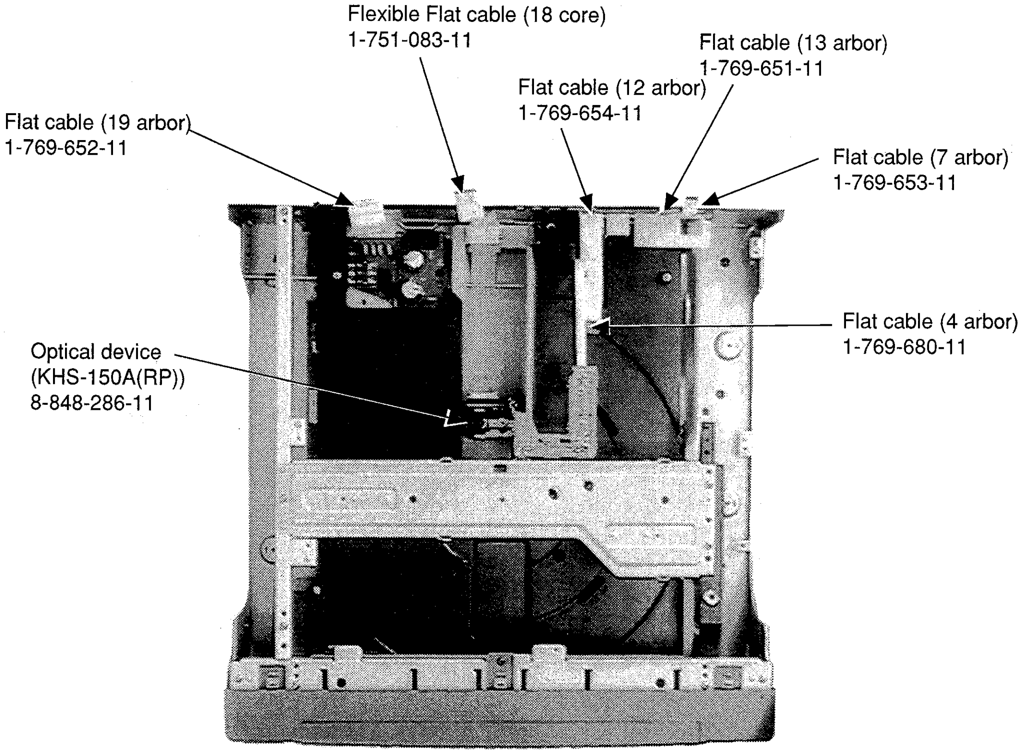
❶ Screw (BVTP 3×6)
❸ Tray UD frame assembly
❹ L sub base assembly
❺ Idler gear
❷ UD frame holder
L sub base assembly
Idler gear
Loading base assembly

- Positioning the idler gear

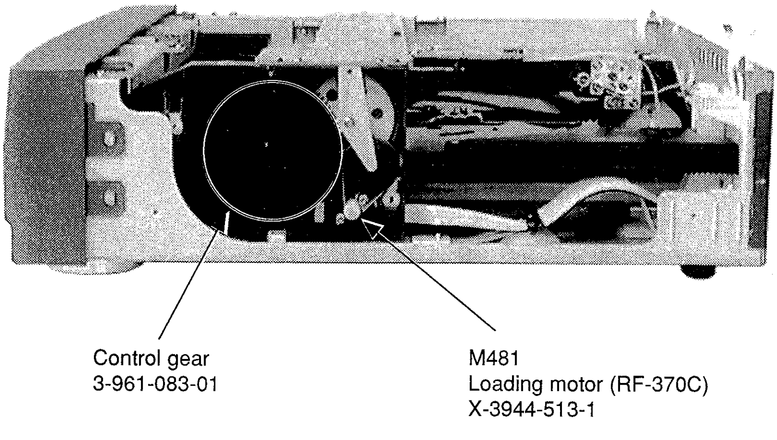
Mount the idler gear with its notch faced upper right (indicated by the arrow).

2-11. INTERNAL VIEWS

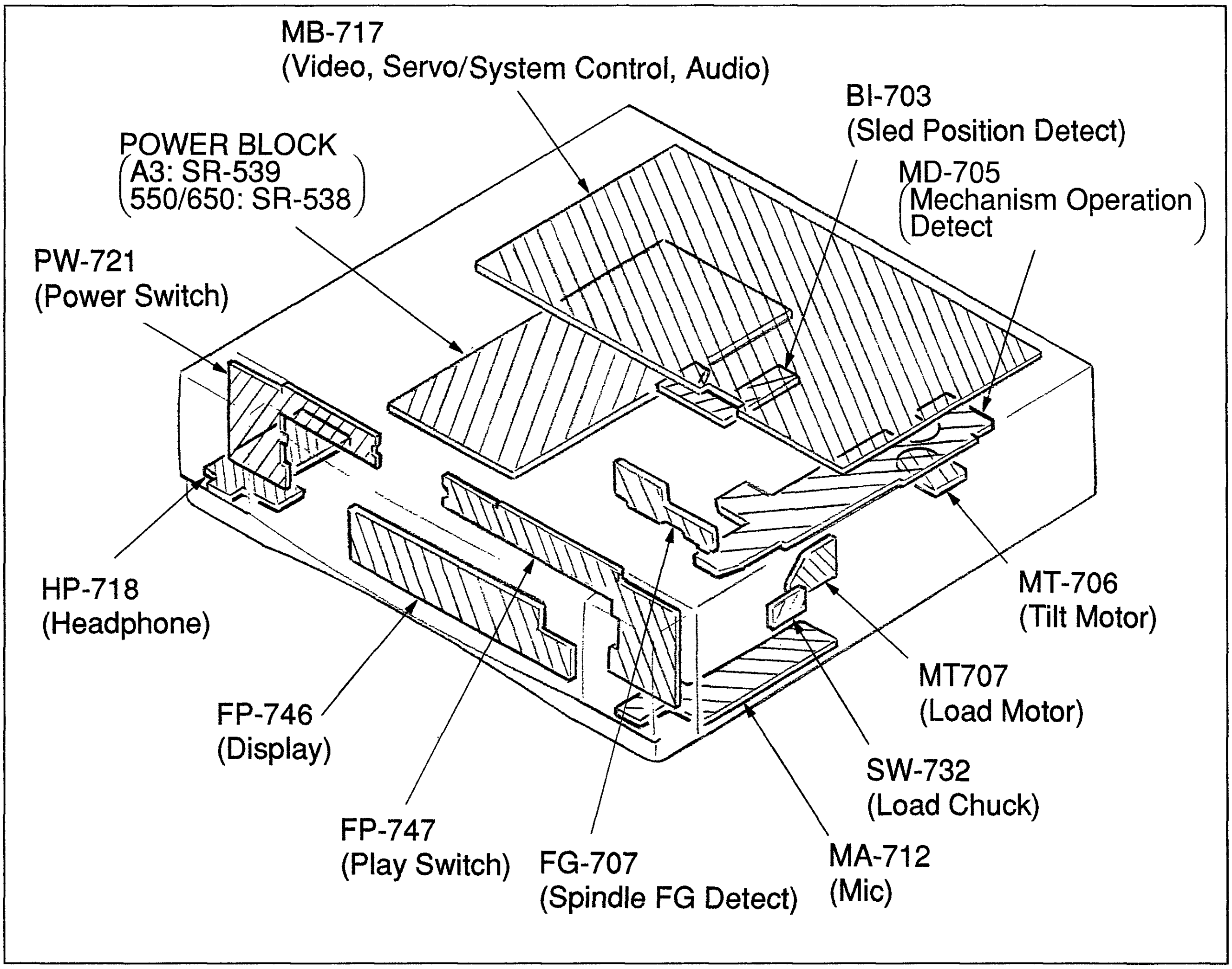
—Top View—


Flexible Flat cable (18 core)
1-751-083-11
Flat cable (13 arbor)
1-769-651-11
Flat cable (12 arbor)
1-769-654-11
Flat cable (19 arbor)
1-769-652-11
Flat cable (7 arbor)
1-769-653-11
Flat cable (4 arbor)
1-769-680-11
Optical device
(KHS-150A(RP))
8-848-286-11

—Side View—

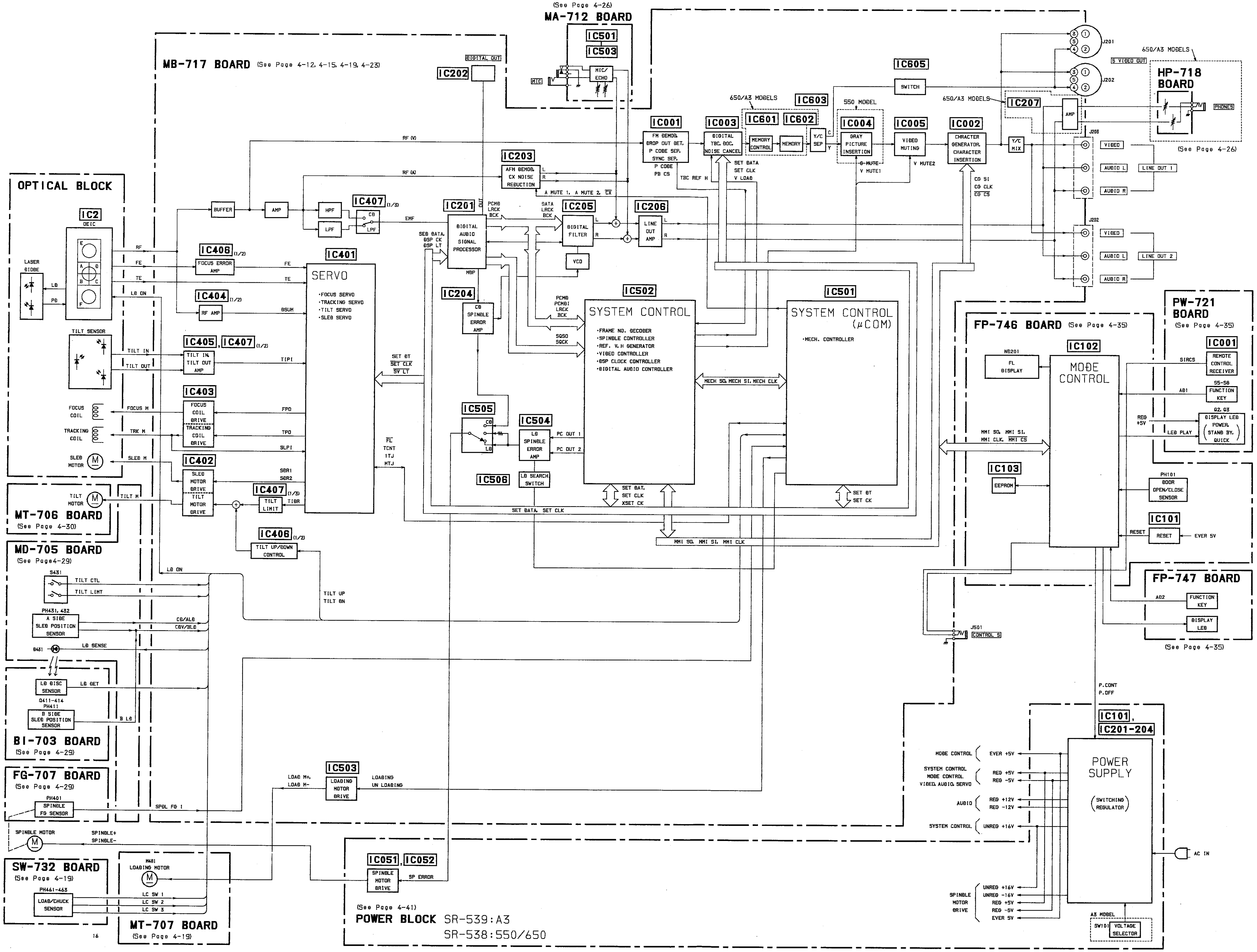

Control gear
3-961-083-01
M481
Loading motor (RF-370C)
X-3944-513-1

2-12. CIRCUIT BOARDS LOCATION

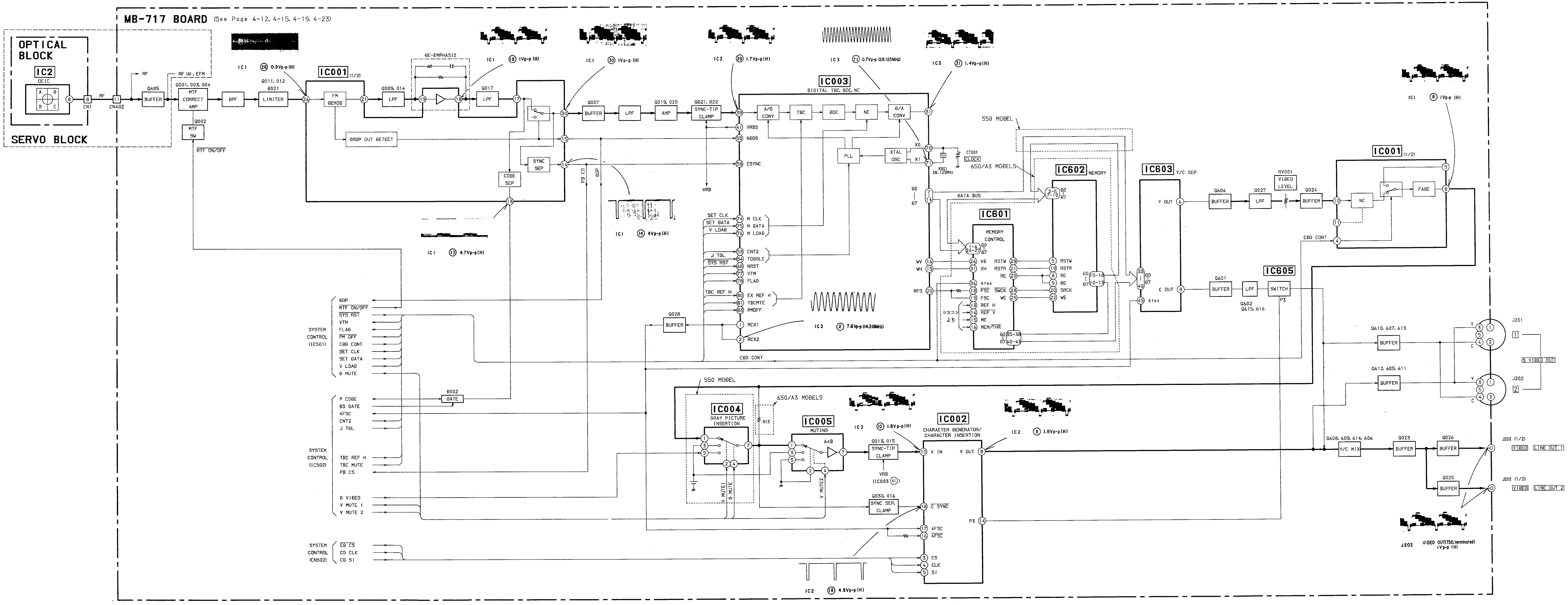

MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation
Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

SECTION 3
BLOCK DIAGRAMS

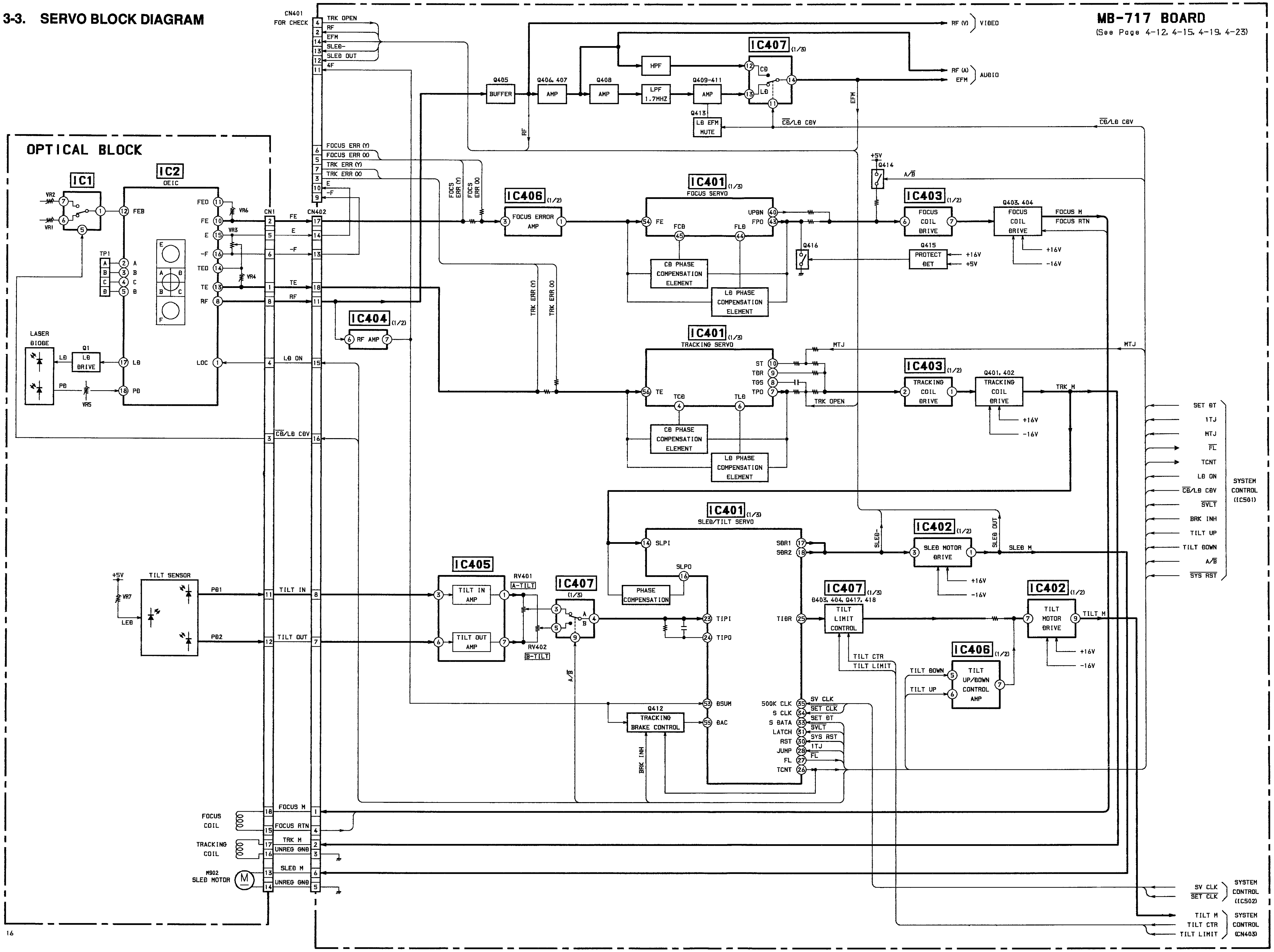
3-1. OVERALL BLOCK DIAGRAM


MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
DIGITAL OUT
IC202
(See Page 4-26)
MA-712 BOARD
IC501
IC503
MIC/ECHO
MIC
OPTICAL BLOCK
IC2
OEIC
LASER DIODE
LD
PD
RF
FE
TE
LD ON
TILT SENSOR
TILT IN
TILT OUT
FOCUS COIL
FOCUS M
TRACKING COIL
TRK M
SLED MOTOR
SLED M
BUFFER
AMP
HPF
LPF
IC407 (1/3)
CD
LPF
EMF
RF (V)
RF (A)
IC406 (1/2)
FOCUS ERROR AMP
IC404 (1/2)
RF AMP
DSUM
IC401
SERVO
·FOCUS SERVO
·TRACKING SERVO
·TILT SERVO
·SLED SERVO
IC405, IC407 (1/2)
TILT IN, TILT OUT AMP
TIPI
IC403
FOCUS COIL DRIVE
TRACKING COIL DRIVE
FPO
TPO
SLPI
IC402
SLED MOTOR DRIVE
TILT MOTOR DRIVE
SDR1
SDR2
IC407 (1/3)
TILT LIMIT
TIDR
IC406 (1/2)
TILT UP/DOWN CONTROL
TILT UP
TILT DN
SET DT
SET CLK
SV LT
FL
TCNT
1TJ
MTJ
TILT MOTOR
TILT M
MT-706 BOARD
(See Page 4-30)
MD-705 BOARD
(See Page4-29)
S431
TILT CTL
TILT LIMT
PH431, 432
A SIDE SLED POSITION SENSOR
CD/ALD
CDV/BLD
D431
LD SENSE
LD ON
LD DISC SENSOR
LD DET
Q411-414
PH411
B SIDE SLED POSITION SENSOR
B LD
BI-703 BOARD
(See Page 4-29)
FG-707 BOARD
(See Page 4-29)
PH401
SPINDLE FG SENSOR
SPDL FG 1
SPINDLE MOTOR
SPINDLE+
SPINDLE-
SW-732 BOARD
(See Page 4-19)
PH461-463
LOAD/CHUCK SENSOR
M481
LOADING MOTOR
LC SW 1
LC SW 2
LC SW 3
MT-707 BOARD
(See Page 4-19)
16
IC503
LOADING MOTOR DRIVE
LOAD M+, LOAD M-
LOADING
UN LOADING
IC051, IC052
SPINDLE MOTOR DRIVE
SP ERROR
(See Page 4-41)
POWER BLOCK SR-539:A3
SR-538:550/650
IC201
DIGITAL AUDIO SIGNAL PROCESSOR
OUT
PCMD
LRCK
BCK
SED DATA, DSP CK, DSP LT
MDP
IC203
AFM DEMOD, CX NOISE REDUCTION
L
R
A MUTE 1, A MUTE 2, CX
DATA
LRCK
BCK
IC205
DIGITAL FILTER
VCO
IC206
LINE OUT AMP
IC204
CD SPINDLE ERROR AMP
PCMD
PCMDI
LRCK
BCK
SQSO
SQCK
IC502
SYSTEM CONTROL
·FRAME NO. DECODER
·SPINDLE CONTROLLER
·REF. V, H GENERATOR
·VIDEO CONTROLLER
·DSP CLOCK CONTROLLER
·DIGITAL AUDIO CONTROLLER
IC505
CD
LD
IC504
LD SPINDLE ERROR AMP
PC OUT 1
PC OUT 2
IC506
LD SEARCH SWITCH
SET DAT, SET CLK, XSET CK
SET DATA, SET CLK
MECH SO, MECH SI, MECH CLK
IC501
SYSTEM CONTROL (μCOM)
·MECH. CONTROLLER
SET DT
SET CK
MMI SO, MMI SI, MMI CLK
IC001
FM DEMOD, DROP OUT DET, P CODE SEP, SYNC SEP
P CODE
PB CS
TBC REF H
IC003
DIGITAL TBC, DOC, NOISE CANCEL
SET DATA
SET CLK
V LOAD
650/A3 MODELS
IC603
IC601
IC602
MEMORY CONTROL
MEMORY
Y/C SEP
C
Y
550 MODEL
IC004
GRAY PICTURE INSERTION
G MUTE
V MUTE1
IC605
SWITCH
IC005
VIDEO MUTING
V MUTE2
IC002
CHRACTER GENERATOR, CHARACTER INSERTION
CG SI
CG CLK
CG CS
650/A3 MODELS
IC207
AMP
Y/C MIX
J201
J202
③ ①
⑤
④ ②
S VIDEO OUT
650/A3 MODELS
HP-718 BOARD
PHONES
(See Page 4-26)
J203
VIDEO
AUDIO L
AUDIO R
LINE OUT 1
J202
VIDEO
AUDIO L
AUDIO R
LINE OUT 2
FP-746 BOARD (See Page 4-35)
ND201
FL DISPLAY
IC102
MODE CONTROL
MMI SO, MMI SI, MMI CLK, MMI CS
IC103
EEPROM
PW-721 BOARD
(See Page 4-35)
IC001
REMOTE CONTROL RECEIVER
SIRCS
S5-S8
FUNCTION KEY
AD1
Q2, Q3
DISPLAY LED POWER, STAND BY, QUICK
REG +5V
LED PLAY
PH101
DOOR OPEN/CLOSE SENSOR
IC101
RESET
RESET
EVER 5V
FP-747 BOARD
AD2
FUNCTION KEY
DISPLAY LED
(See Page 4-35)
J501
CONTROL S
P.CONT
P.OFF
IC101, IC201-204
POWER SUPPLY
(SWITCHING REGULATOR)
MODE CONTROL
EVER +5V
SYSTEM CONTROL
MODE CONTROL
VIDEO, AUDIO, SERVO
REG +5V
REG -5V
AUDIO
REG +12V
REG -12V
SYSTEM CONTROL
UNREG +16V
SPINDLE MOTOR DRIVE
UNREG +16V
UNREG -16V
REG +5V
REG -5V
EVER 5V
AC IN
A3 MODEL
SW101
VOLTAGE SELECTOR

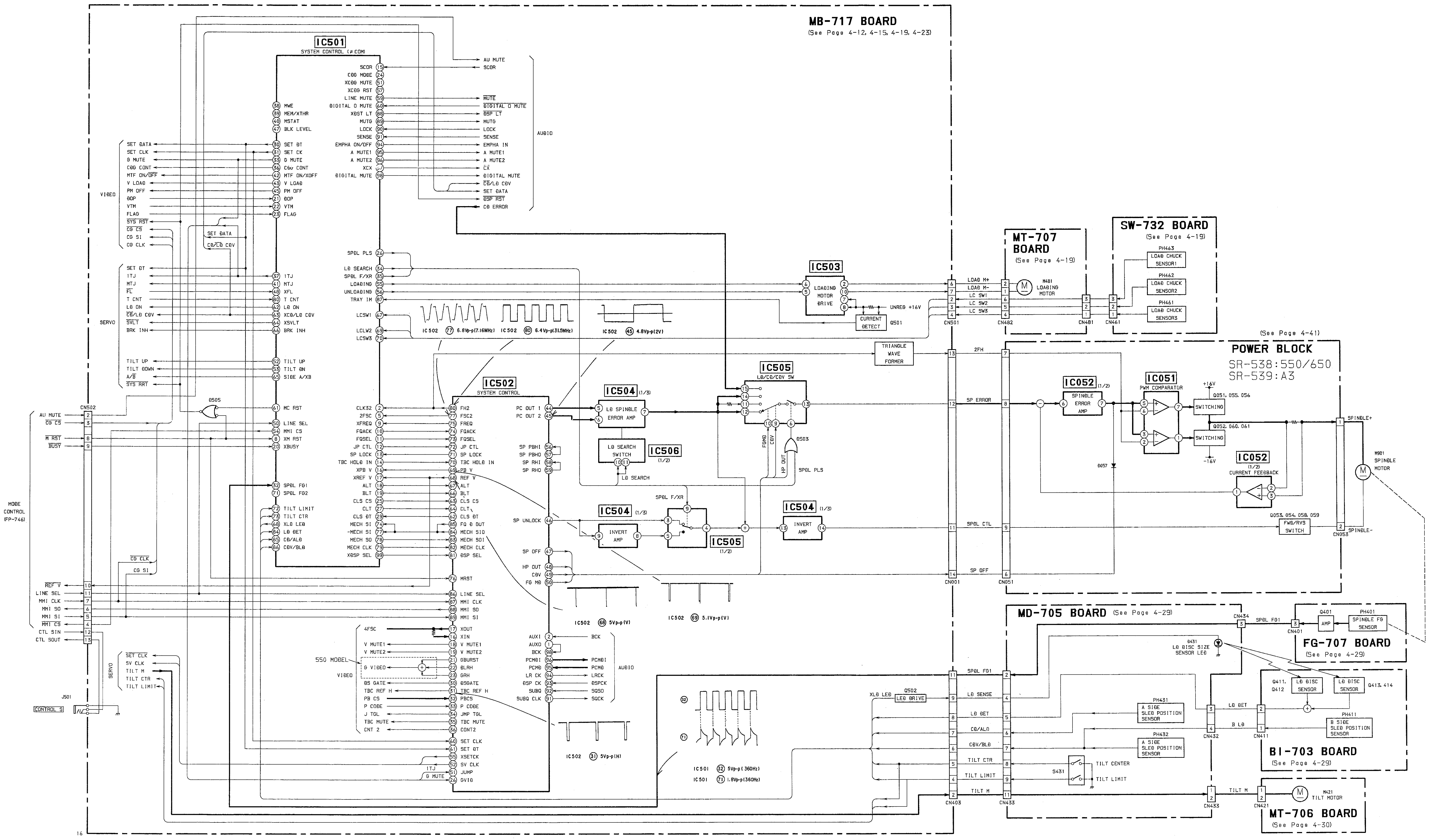
3-2. VIDEO BLOCK DIAGRAM


MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
OPTICAL BLOCK
IC2
OEIC
SERVO BLOCK
CN1
CN402
RF
RF (A), EFM
Q405
BUFFER
Q001, 003, 004
MTF CORRECT AMP
Q002
MTF SW
MTF ON/OFF
BPF
Q011, 012
Q001
LIMITER
IC001 (1/2)
FM DEMOD
DROP OUT DETECT
Q009, 014
LPF
DE-EMPHASIS
Q017
LPF
SYNC SEP
CODE SEP
PB CS
DOP
Q007
BUFFER
LPF
Q019, 020
AMP
Q021, 022
SYNC-TIP CLAMP
VRB
IC003
DIGITAL TBC, DOC, NC
A/D CONV
TBC
DOC
NC
D/A CONV
PLL
XTAL OSC
X0
X1
X001 28.125MHz
CT001 CLOCK
VRBS
NDOD
CSYNC
SET CLK
SET DATA
V LOAD
M CLK
M DATA
M LOAD
CNT2
J TGL
SYS RST
TOGGLE
NRST
VTM
FLAG
TBC REF H
EX REF H
TBCMTE
PMOFF
RCX1
RCX2
Q028
BUFFER
D0
D7
DATA BUS
WV
WH
RFS
550 MODEL
650/A3 MODELS
IC602 MEMORY
IC601
MEMORY CONTROL
VD
VH
RSTW
RSTR
RE
4fsc
FSC
SWCK
WE
REF H
REF V
ME
MEM/THR
OE
SRCK
IC603 Y/C SEP
Y OUT
C OUT
Q604
BUFFER
Q027
LPF
RV001 VIDEO LEVEL
Q024
BUFFER
IC001 (1/2)
NC
FADE
CDG CONT
Q601
BUFFER
LPF
Q602
Q615, 616
IC605
SWITCH
P3
J201
J202
S VIDEO OUT
Q610, 607, 613
Q612, 605, 611
BUFFER
Q608, 609, 614, 606
Y/C MIX
Q023
BUFFER
Q026
BUFFER
Q025
BUFFER
J203 (1/2)
J202 (1/2)
VIDEO
LINE OUT 1
LINE OUT 2
J203 VIDEO OUT(75Ω terminated) 1Vp-p (H)
SYSTEM CONTROL (IC501)
DOP
MTF ON/OFF
SYS RST
VTM
FLAG
PM OFF
CDG CONT
SET CLK
SET DATA
V LOAD
G MUTE
P CODE
DS GATE
4FSC
CNT2
J TGL
Q002
GATE
SYSTEM CONTROL (IC502)
TBC REF H
TBC MUTE
PB CS
G VIDEO
V MUTE 1
V MUTE 2
SYSTEM CONTROL (CN502)
CG CS
CG CLK
CG SI
550 MODEL
650/A3 MODELS
IC004 GRAY PICTURE INSERTION
R13
IC005 MUTING
6dB
G MUTE
V MUTE1
V MUTE2
Q013, 015
SYNC-TIP CLAMP
VRB (IC003 41)
Q030, 016
SYNC SEP. CLAMP
IC002 CHARACTER GENERATOR/ CHARACTER INSERTION
V IN
V OUT
C SYNC
4FSC
CS
CLK
SI
P3
IC1 26 0.9Vp-p (H)
IC1 18 1Vp-p (H)
IC1 30 1Vp-p (H)
IC3 39 1.7Vp-p (H)
IC3 21 0.7Vp-p (28.125MHz)
IC3 31 1.4Vp-p (H)
IC1 8 1Vp-p (H)
IC1 13 4.7Vp-p (H)
IC1 14 4Vp-p (H)
IC3 2 7.6Vp-p (14.31MHz)
IC2 10 1.8Vp-p (H)
IC2 8 1.8Vp-p (H)
IC2 18 4.8Vp-p (H)

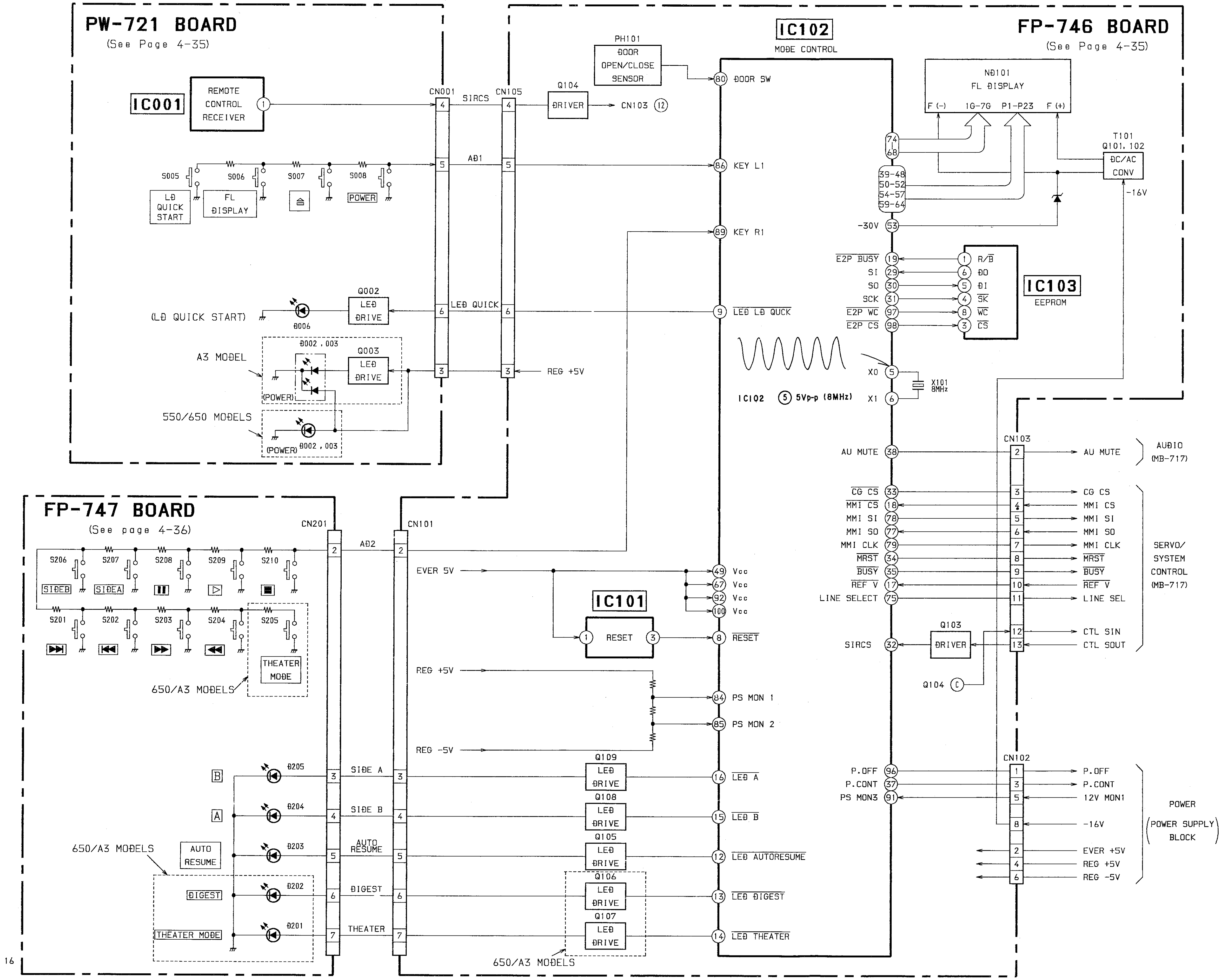
3-3. SERVO BLOCK DIAGRAM


MB-717 BOARD
(See Page 4-12, 4-15, 4-19, 4-23)
OPTICAL BLOCK
IC1
IC2
OEIC
FEB
FEO
FE
E
-F
TEO
TE
RF
LOC
LD
PD
VR1
VR2
VR3
VR4
VR5
VR6
VR7
TP1
A
B
C
D
E
F
LASER DIODE
Q1
LD DRIVE
TILT SENSOR
+5V
PD1
PD2
LED
FOCUS COIL
TRACKING COIL
M902
SLED MOTOR
M
CN1
CN401
FOR CHECK
TRK OPEN
EFM
SLED-
SLED OUT
4F
FOCUS ERR (Y)
FOCUS ERR (X)
TRK ERR (Y)
TRK ERR (X)
CN402
LD ON
CD/LD CDV
TILT IN
TILT OUT
FOCUS M
FOCUS RTN
TRK M
UNREG GND
SLED M
Q405
BUFFER
Q406, 407
AMP
Q408
HPF
LPF
1.7MHZ
Q409-411
Q413
LD EFM
MUTE
IC407 (1/3)
CD
LD
RF (V)
VIDEO
RF (A)
AUDIO
IC406 (1/2)
FOCUS ERROR AMP
FOCS ERR (Y)
FOCS ERR (X)
IC401 (1/3)
FOCUS SERVO
UPDN
FPO
FCD
FLD
CD PHASE COMPENSATION ELEMENT
LD PHASE COMPENSATION ELEMENT
Q414
+5V
A/B
Q416
IC403 (1/2)
FOCUS COIL DRIVE
Q415
PROTECT DET
+16V
-16V
Q403, 404
FOCUS DRIVE
IC404 (1/2)
RF AMP
TRK ERR (Y)
TRK ERR (X)
IC401 (1/3)
TRACKING SERVO
ST
TDR
TGS
TPO
TCD
TLD
MTJ
TRACKING COIL DRIVE
Q401, 402
TRACKING COIL DRIVE
SET DT
ITJ
FL
TCNT
LD ON
CD/LD CDV
SVLT
BRK INH
TILT UP
TILT DOWN
A/B
SYS RST
SYSTEM CONTROL (IC501)
IC401 (1/3)
SLED/TILT SERVO
SLPI
SLPO
PHASE COMPENSATION
SDR1
SDR2
IC402 (1/2)
SLED MOTOR DRIVE
SLED OUT
IC405
TILT IN AMP
TILT OUT AMP
RV401
A-TILT
RV402
B-TILT
IC407 (1/3)
TIPI
TIPO
TIDR
D403, 404, Q417, 418
TILT LIMIT CONTROL
TILT CTR
TILT LIMIT
IC402 (1/2)
TILT MOTOR DRIVE
TILT M
IC406 (1/2)
TILT UP/DOWN CONTROL AMP
DSUM
DAC
Q412
TRACKING BRAKE CONTROL
BRK INH
500K CLK
S CLK
S DATA
LATCH
RST
JUMP
FL
TCNT
SV CLK
SET CLK
SET DT
SVLT
SYS RST
ITJ
SYSTEM CONTROL (IC502)
SYSTEM CONTROL (CN403)
16

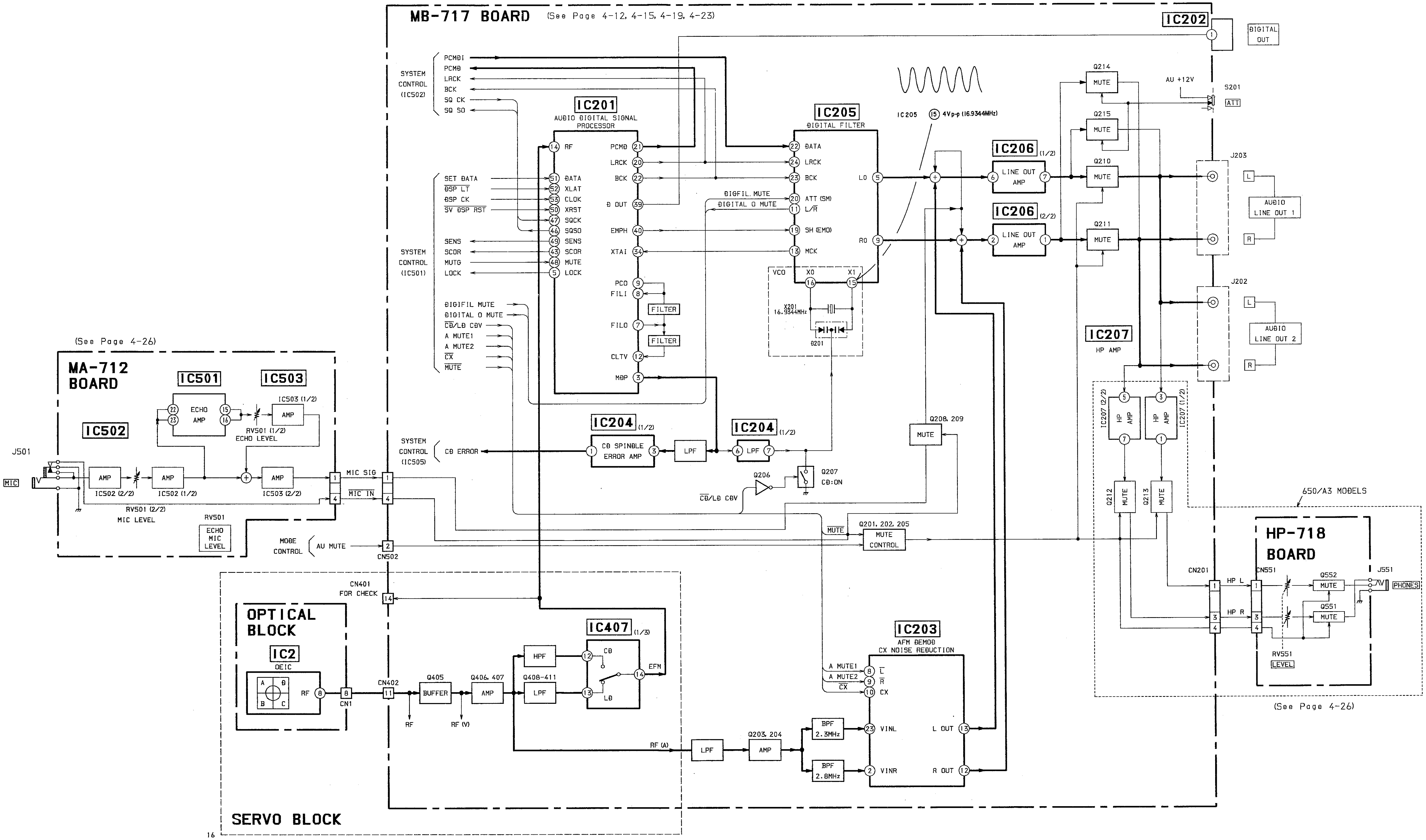
3-4. SYSTEM CONTROL BLOCK DIAGRAM


MB-717 BOARD
(See Page 4-12, 4-15, 4-19, 4-23)
IC501
SYSTEM CONTROL (μ COM)
IC502
SYSTEM CONTROL
IC503
LOADING MOTOR DRIVE
IC504
LD SPINDLE ERROR AMP
IC504
INVERT AMP
IC505
LD/CD/CDV SW
IC505
IC506
LD SEARCH SWITCH
TRIANGLE WAVE FORMER
CURRENT DETECT
Q501
UNREG +16V
AUDIO
VIDEO
SERVO
MODE CONTROL (FP-746)
CN502
CN501
CN001
CN403
J501
CONTROL S
550 MODEL
IC502 ⑦⑦ 6.6Vp-p(7.16MHz)
IC502 ⑧⓪ 6.4Vp-p(31.5MHz)
IC502 ④⑤ 4.8Vp-p(2V)
IC502 ⑥⑧ 5Vp-p(V)
IC502 ⑥⑨ 3.1Vp-p(V)
IC502 ③① 5Vp-p(H)
IC501 ⑦② 5Vp-p(360Hz)
IC501 ⑦① 1.8Vp-p(360Hz)
MT-707 BOARD
(See Page 4-19)
M481 LOADING MOTOR
CN482
CN481
SW-732 BOARD
(See Page 4-19)
PH463 LOAD CHUCK SENSOR1
PH462 LOAD CHUCK SENSOR2
PH461 LOAD CHUCK SENSOR3
CN461
(See Page 4-41)
POWER BLOCK
SR-538:550/650
SR-539:A3
IC052 (1/2) SPINDLE ERROR AMP
IC051 PWM COMPARATOR
Q051, 055, 056 SWITCHING
Q052, 060, 061 SWITCHING
IC052 (1/2) CURRENT FEEDBACK
Q053, 054, 058, 059 FWD/RVS SWITCH
M901 SPINDLE MOTOR
SPINDLE+
SPINDLE-
CN051
CN053
MD-705 BOARD (See Page 4-29)
D431 LD DISC SIZE SENSOR LED
Q502 LED DRIVE
PH431 A SIDE SLED POSITION SENSOR
PH432 A SIDE SLED POSITION SENSOR
S431 TILT CENTER TILT LIMIT
CN433
CN432
CN434
FG-707 BOARD
(See Page 4-29)
Q401 AMP
PH401 SPINDLE FG SENSOR
CN401
BI-703 BOARD
(See Page 4-29)
Q411, Q412 LD DISC SENSOR
Q413, 414 LD DISC SENSOR
PH411 B SIDE SLED POSITION SENSOR
CN411
MT-706 BOARD
(See Page 4-30)
M421 TILT MOTOR
CN421

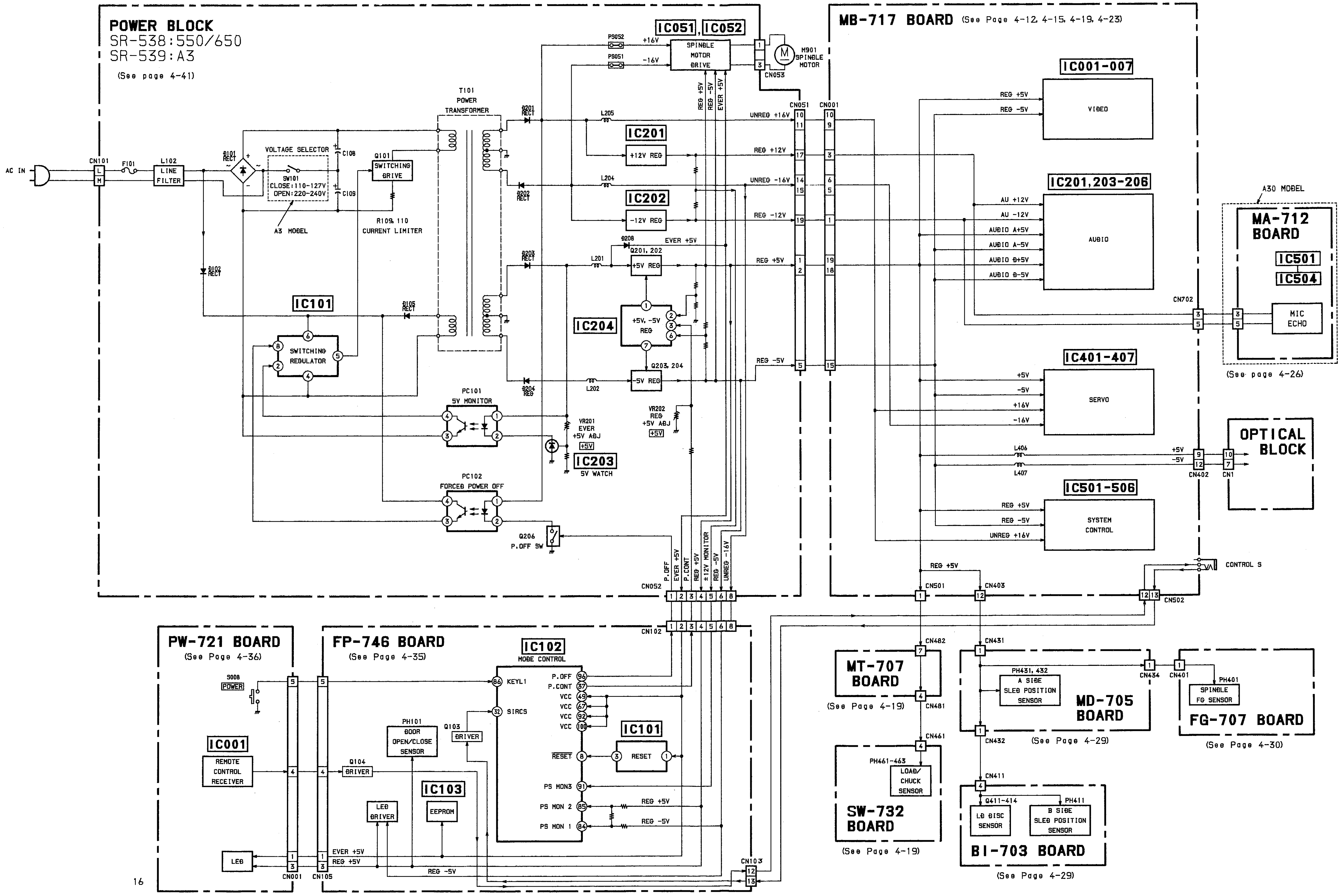
3-5. MODE CONTROL BLOCK DIAGRAM


PW-721 BOARD
(See Page 4-35)
IC001
REMOTE CONTROL RECEIVER
S005
S006
S007
S008
LD QUICK START
FL DISPLAY
POWER
Q002
LED DRIVE
(LD QUICK START)
D006
A3 MODEL
D002, 003
Q003
LED DRIVE
(POWER)
550/650 MODELS
(POWER) D002, 003
CN001
CN105
SIRCS
AD1
LED QUICK
REG +5V
FP-746 BOARD
(See Page 4-35)
PH101
DOOR OPEN/CLOSE SENSOR
Q104
DRIVER
CN103 ⑫
IC102
MODE CONTROL
DOOR SW
KEY L1
KEY R1
LED LD QUCK
ND101
FL DISPLAY
F (-)
1G-7G
P1-P23
F (+)
T101
Q101, 102
DC/AC CONV
-16V
74-68
39-48
50-52
54-57
59-64
-30V
E2P BUSY
SI
SO
SCK
E2P WC
E2P CS
R/B
DO
DI
SK
WC
CS
IC103
EEPROM
X0
X1
X101 8MHz
IC102 ⑤ 5Vp-p (8MHz)
CN103
AU MUTE
AUDIO (MB-717)
CG CS
MMI CS
MMI SI
MMI SO
MMI CLK
MRST
BUSY
REF V
LINE SELECT
LINE SEL
SERVO/ SYSTEM CONTROL (MB-717)
Q103
DRIVER
SIRCS
CTL SIN
CTL SOUT
Q104 Ⓒ
CN102
P.OFF
P.CONT
PS MON3
12V MON1
-16V
EVER +5V
REG +5V
REG -5V
POWER (POWER SUPPLY BLOCK)
FP-747 BOARD
(See page 4-36)
CN201
CN101
AD2
S206
S207
S208
S209
S210
SIDEB
SIDEA
S201
S202
S203
S204
S205
THEATER MODE
650/A3 MODELS
EVER 5V
Vcc
IC101
RESET
REG +5V
PS MON 1
PS MON 2
REG -5V
B
A
D205
D204
D203
D202
D201
SIDE A
SIDE B
AUTO RESUME
DIGEST
THEATER
650/A3 MODELS
Q109
Q108
Q105
Q106
Q107
LED DRIVE
LED A
LED B
LED AUTORESUME
LED DIGEST
LED THEATER
650/A3 MODELS
16

3-6. AUDIO BLOCK DIAGRAM

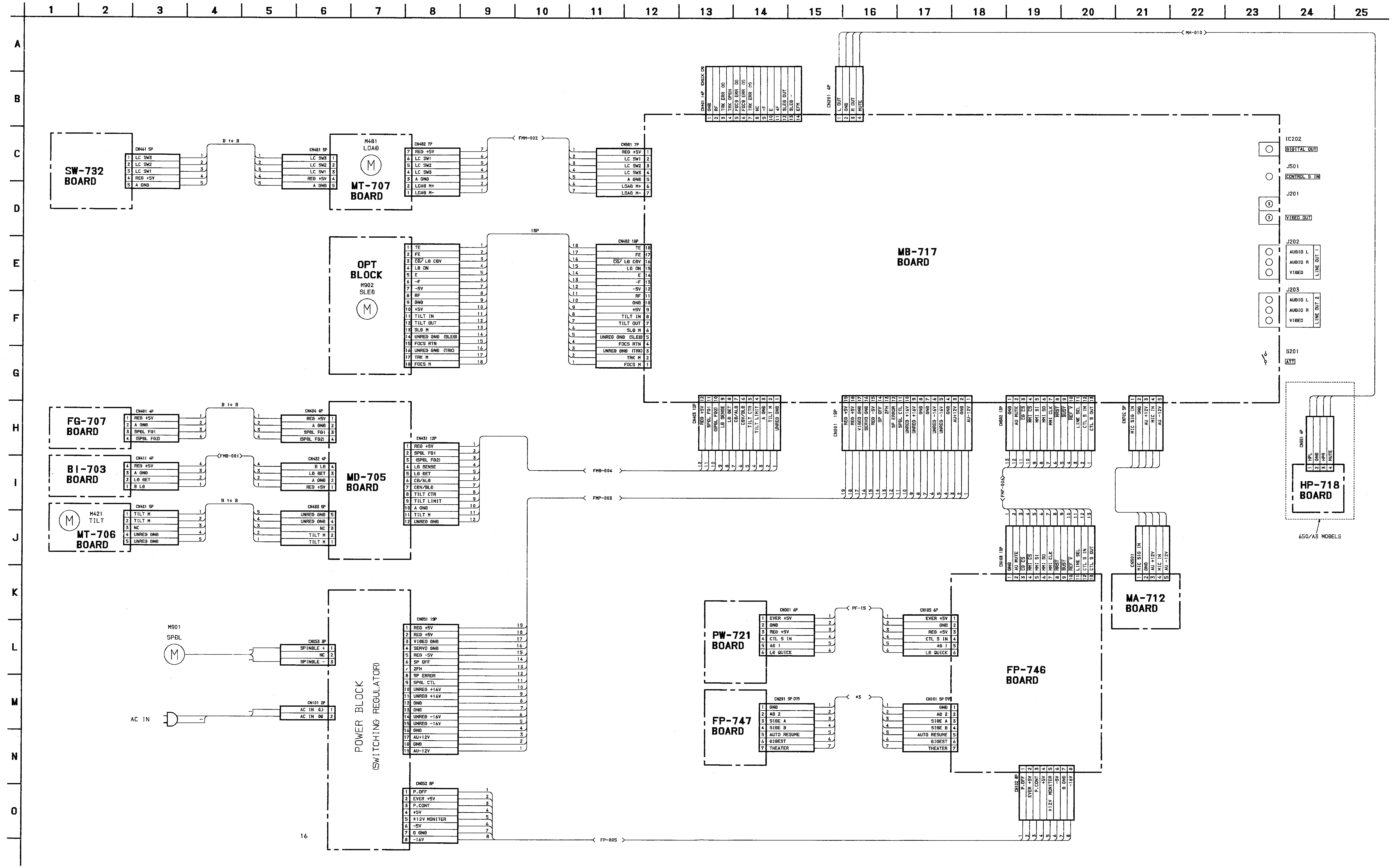

MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
IC202
DIGITAL OUT
SYSTEM CONTROL (IC502)
PCMDI
PCMD
LRCK
BCK
SQ CK
SQ SO
IC201
AUDIO DIGITAL SIGNAL PROCESSOR
RF
PCMD
LRCK
BCK
D OUT
EMPH
XTAI
PCO
FILI
FILO
CLTV
MDP
SET DATA
DSP LT
DSP CK
SV DSP RST
DATA
XLAT
CLOK
XRST
SQCK
SQSO
SENS
SCOR
MUTG
LOCK
MUTE
SYSTEM CONTROL (IC501)
DIGIFIL MUTE
DIGITAL O MUTE
CD/LD CDV
A MUTE1
A MUTE2
CX
MUTE
FILTER
FILTER
IC205
DIGITAL FILTER
DATA
LRCK
BCK
ATT (SM)
L/R
SH (EMD)
MCK
LO
RO
VCO
XO
XI
X201 16.9344MHz
D201
DIGFIL MUTE
DIGITAL O MUTE
IC205 ⑮ 4Vp-p (16.9344MHz)
IC206 (1/2)
LINE OUT AMP
IC206 (2/2)
LINE OUT AMP
Q214
MUTE
Q215
MUTE
Q210
MUTE
Q211
MUTE
AU +12V
S201
ATT
J203
L
R
AUDIO LINE OUT 1
J202
L
R
AUDIO LINE OUT 2
IC207
HP AMP
IC207 (2/2)
HP AMP
HP AMP
IC207 (1/2)
Q212
MUTE
Q213
MUTE
650/A3 MODELS
Q208, 209
MUTE
IC204 (1/2)
CD SPINDLE ERROR AMP
LPF
IC204 (1/2)
LPF
Q206
Q207
CD:ON
CD/LD CDV
SYSTEM CONTROL (IC505)
CD ERROR
Q201, 202, 205
MUTE
MUTE CONTROL
MODE CONTROL
AU MUTE
CN502
MIC SIG
MIC IN
(See Page 4-26)
MA-712 BOARD
IC501
IC503
IC502
ECHO AMP
IC503 (1/2)
AMP
RV501 (1/2)
ECHO LEVEL
J501
MIC
AMP
IC502 (2/2)
AMP
IC502 (1/2)
AMP
IC503 (2/2)
RV501 (2/2)
MIC LEVEL
RV501
ECHO MIC LEVEL
CN401
FOR CHECK
OPTICAL BLOCK
IC2
OEIC
RF
CN1
CN402
Q405
BUFFER
RF
RF (V)
Q406, 407
AMP
HPF
Q408-411
LPF
IC407 (1/3)
CD
LD
EFM
RF (A)
LPF
Q203, 204
AMP
BPF 2.3MHz
BPF 2.8MHz
IC203
AFM DEMOD
CX NOISE REDUCTION
A MUTE1
A MUTE2
CX
L
R
CX
VINL
VINR
L OUT
R OUT
SERVO BLOCK
HP-718 BOARD
CN201
CN551
HP L
HP R
J551
PHONES
Q552
MUTE
Q551
MUTE
RV551
LEVEL
(See Page 4-26)

3-7. POWER BLOCK DIAGRAM


POWER BLOCK
SR-538:550/650
SR-539:A3
(See page 4-41)
AC IN
CN101
F101
L102
LINE FILTER
D101 RECT
VOLTAGE SELECTOR
SW101
CLOSE:110-127V
OPEN:220-240V
A3 MODEL
C108
C109
Q101
SWITCHING DRIVE
R109, 110
CURRENT LIMITER
T101
POWER TRANSFORMER
D102 RECT
IC101
SWITCHING REGULATOR
D105 RECT
PC101
5V MONITOR
PC102
FORCED POWER OFF
Q206
P.OFF SW
D201 RECT
D202 RECT
D203 RECT
D204 REC
L205
L204
L201
L202
IC051, IC052
SPINDLE MOTOR DRIVE
PS052
PS051
+16V
-16V
M901
SPINDLE MOTOR
CN053
IC201
+12V REG
IC202
-12V REG
D208
EVER +5V
Q201, 202
+5V REG
IC204
+5V, -5V REG
Q203, 204
-5V REG
VR201
EVER +5V ADJ
+5V
IC203
5V WATCH
VR202
REG +5V ADJ
REG +5V
REG -5V
EVER +5V
UNREG +16V
REG +12V
UNREG -16V
REG -12V
REG +5V
REG -5V
CN051
CN001
CN052
P.OFF
EVER +5V
P.CONT
REG +5V
±12V MONITOR
REG -5V
UNREG -16V
MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
IC001-007
VIDEO
REG +5V
REG -5V
IC201, 203-206
AUDIO
AU +12V
AU -12V
AUDIO A+5V
AUDIO A-5V
AUDIO D+5V
AUDIO D-5V
CN702
A30 MODEL
MA-712 BOARD
IC501
IC504
MIC ECHO
(See page 4-26)
IC401-407
SERVO
+5V
-5V
+16V
-16V
L406
L407
CN402
CN1
OPTICAL BLOCK
IC501-506
SYSTEM CONTROL
UNREG +16V
CONTROL S
CN501
CN403
CN502
CN102
PW-721 BOARD
(See Page 4-36)
S008
POWER
IC001
REMOTE CONTROL RECEIVER
LED
CN001
CN105
FP-746 BOARD
(See Page 4-35)
PH101
DOOR OPEN/CLOSE SENSOR
Q103
DRIVER
Q104
DRIVER
IC103
EEPROM
LED DRIVER
IC102
MODE CONTROL
KEYL1
SIRCS
P.OFF
P.CONT
VCC
RESET
PS MON3
PS MON 2
PS MON 1
IC101
RESET
EVER +5V
REG +5V
REG -5V
CN103
MT-707 BOARD
(See Page 4-19)
CN482
CN481
CN461
SW-732 BOARD
PH461-463
LOAD/CHUCK SENSOR
(See Page 4-19)
CN431
CN432
CN434
CN401
MD-705 BOARD
PH431, 432
A SIDE SLED POSITION SENSOR
(See Page 4-29)
FG-707 BOARD
PH401
SPINDLE FG SENSOR
(See Page 4-30)
CN411
BI-703 BOARD
Q411-414
LD DISC SENSOR
PH411
B SIDE SLED POSITION SENSOR
(See Page 4-29)
16

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


SW-732 BOARD
MT-707 BOARD
OPT BLOCK
MB-717 BOARD
FG-707 BOARD
BI-703 BOARD
MT-706 BOARD
MD-705 BOARD
HP-718 BOARD
MA-712 BOARD
PW-721 BOARD
FP-746 BOARD
FP-747 BOARD
POWER BLOCK (SWITCHING REGULATOR)
AC IN
650/A3 MODELS

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- ○ : Through hole is omitted.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.*

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- Circled numbers refer to waveforms.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in µF unless otherwise noted. pF: µµF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊣W∿⊢ : fusible resistor.
- ☐ : panel designation.
- ☐ : adjustment for repeair. *
- ━━ : B+ Line. *
- ‒ ‒ ‒ : B– Line. *
- ⇨ : IN/OUT direction of (+, –) B LINE. *
- Circled numbers refer to waveforms.
- Voltages are dc between ground and measurement points. *
- Readings are taken under pause mode.
  (NTSC REF DISC HLV-8 SIDE 1 FRAME No. 4100)
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *

Note: The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

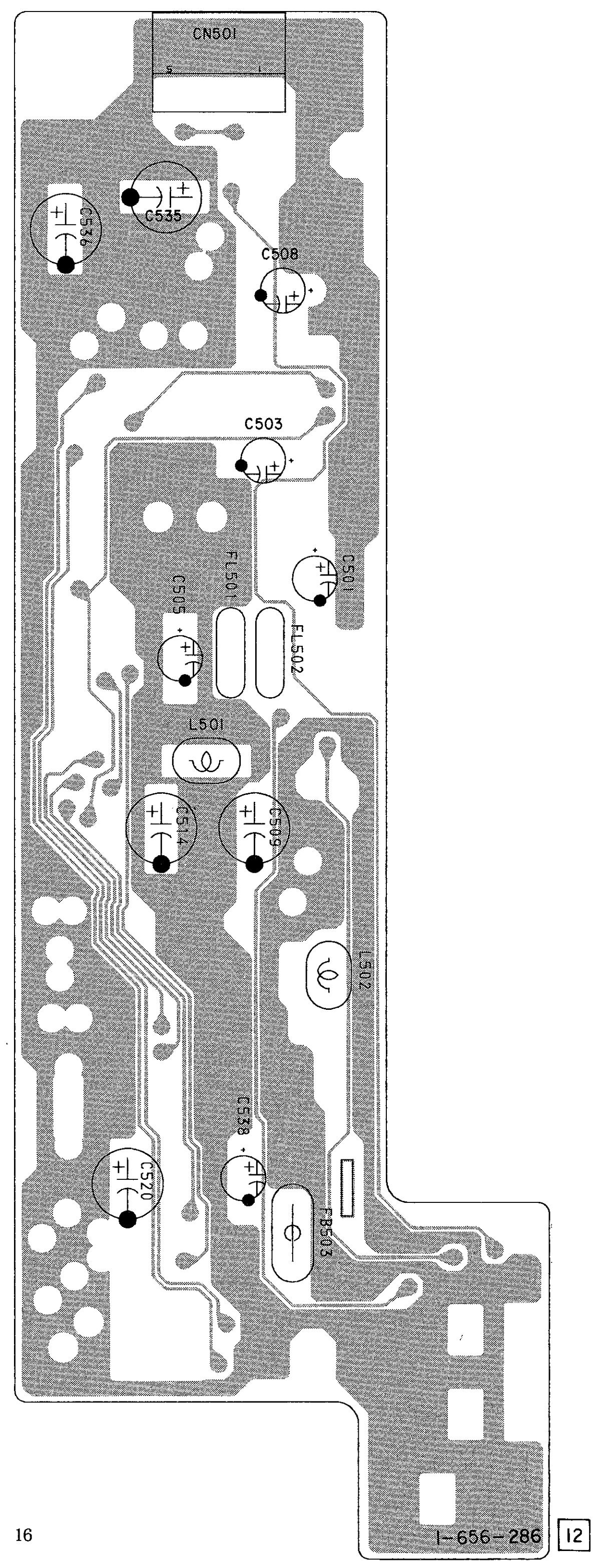
When indicating parts by reference number, please include the board name.

*: indicated by the color red.

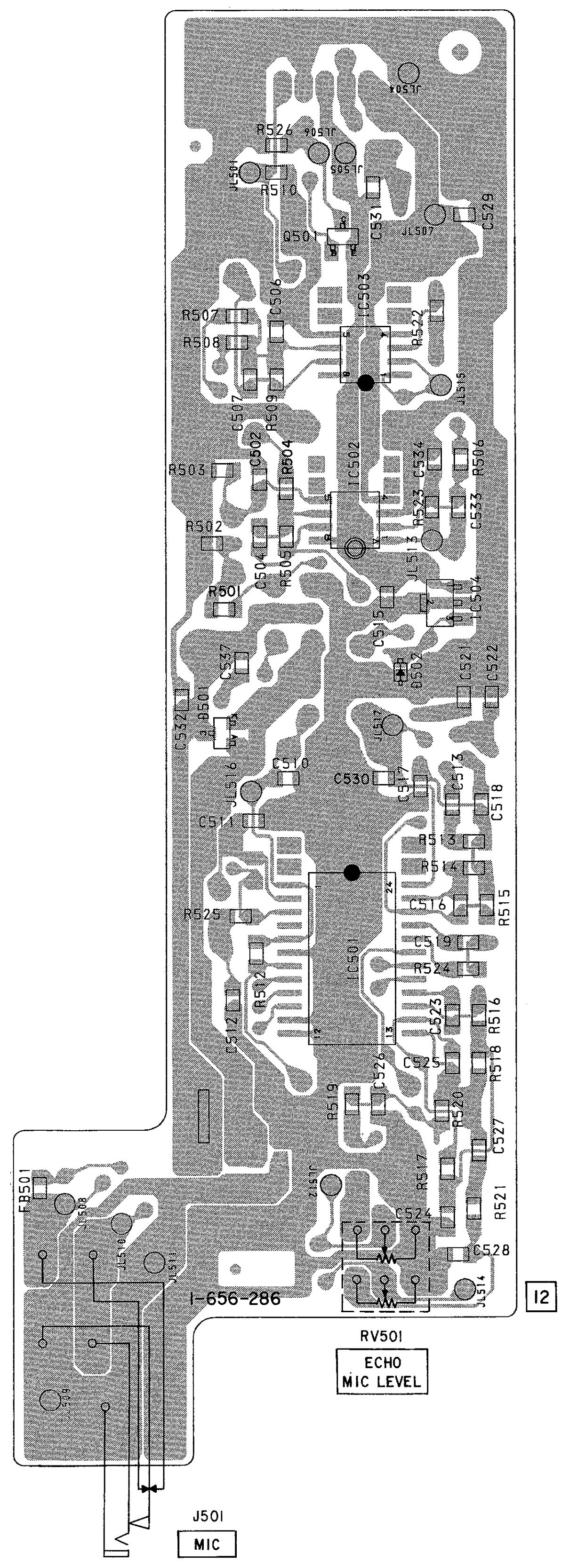
MA-712 (MIC) , HP-718(HEADPHONE) PRINTED WIRING BOARD

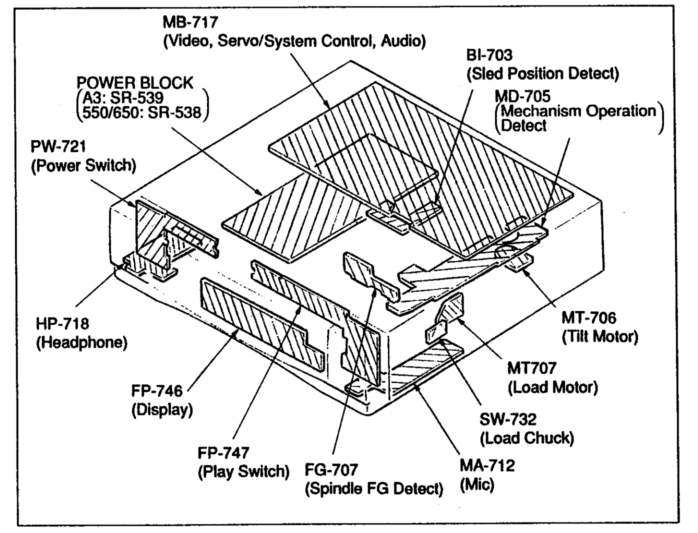
—Ref. No. MA-712 and HP-718 Boards; 3,000 Series—

MA-712 BOARD (COMPONENT SIDE)

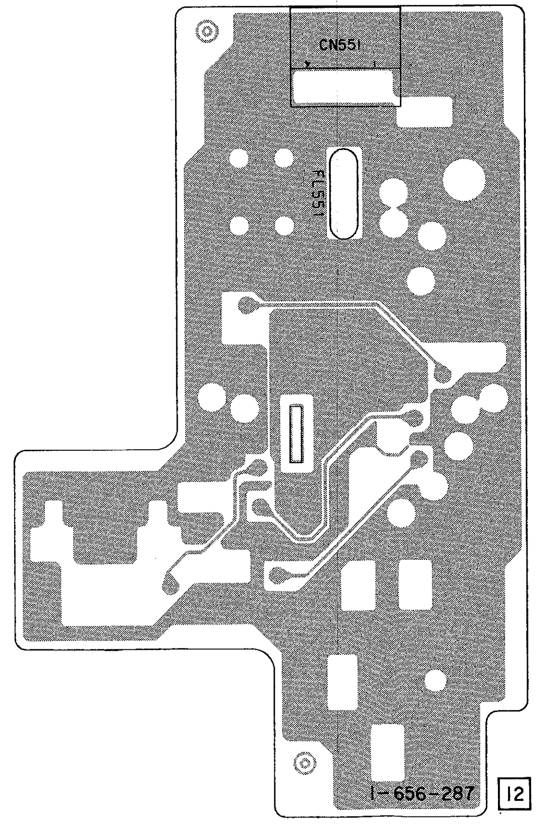

CN501
C508
C503
L501
1-656-286
12

MA-712 BOARD (CONDUCTOR SIDE)

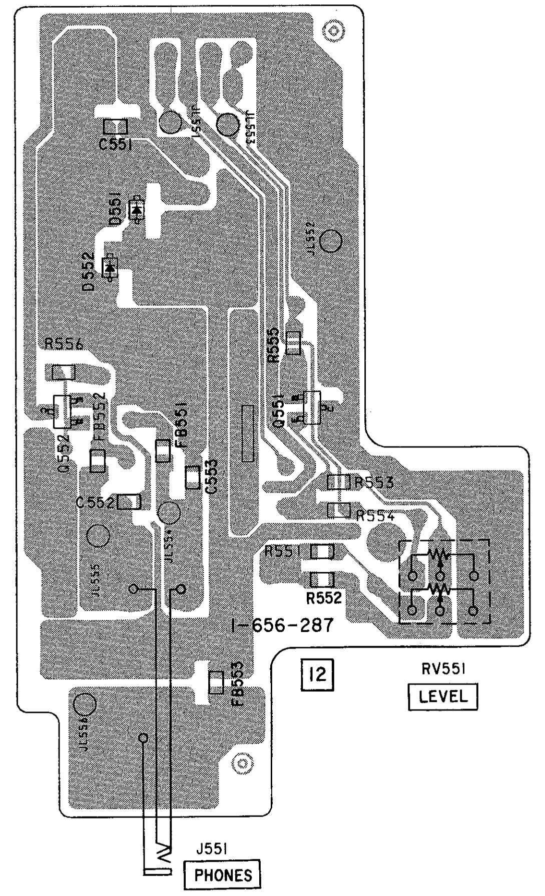

1-656-286
12
RV501
ECHO
MIC LEVEL
J501
MIC


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
FP-746
(Display)
MT707
(Load Motor)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

(650/A3 MODELS)
HP-718 BOARD (COMPONENT SIDE)

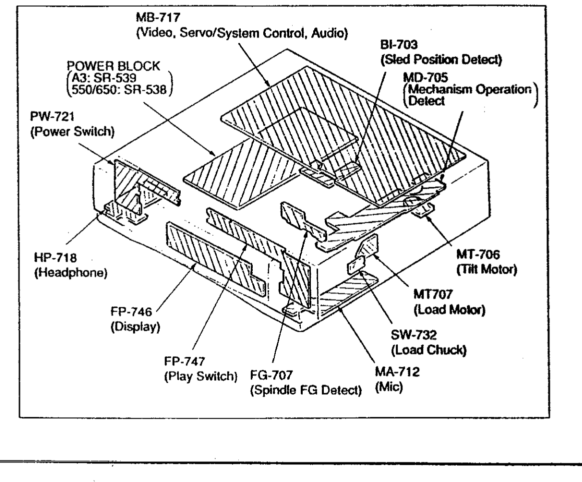

CN551
1-656-287
12

(650/A3 MODELS)
HP-718 BOARD (CONDUCTOR SIDE)


R552
1-656-287
12
RV551
LEVEL
J551
PHONES

MB-717 BOARD

CN001	A-25
CN201	B-15
CN401	A-21
CN402	A-21
CN403	B-18
CN501	A-15
CN502	A-16
CN702	F-15
D001	B-24
D002	G-6
D110	C-27
D111	C-1
D112	C-1
D202	D-11
D203	E-13
D204	A-9
D205	A-8
D206	C-11
D209	C-10
D401	E-7
D402	D-8
D403	C-8
D404	C-8
D405	C-22
D501	G-22
D503	G-7
D504	D-5
D505	E-7
D506	A-4
IC001	C-3
IC002	B-1
IC003	E-25
IC004	B-26
IC005	C-1
IC201	E-17
IC202	A-24
IC203	C-17
IC204	C-13
IC205	D-15
IC206	B-11
IC207	B-12
IC401	D-21
IC402	E-23
IC403	F-23
IC404	B-21
IC405	D-9
IC406	C-7
IC407	C-8
IC501	F-21
IC502	G-21
IC503	E-23
IC504	G-6
IC505	G-7
IC506	G-23
IC601	G-25
IC602	F-26
IC603	E-26
IC605	D-27
Q001	B-24
Q002	C-24
Q003	C-24
Q004	B-4
Q007	C-23
Q009	B-25
Q011	B-4
Q012	B-3
Q013	C-1
Q014	B-25
Q015	C-27
Q016	C-1
Q017	B-2
Q019	D-24
Q020	D-4
Q021	D-24
Q022	D-4
Q023	A-21
Q024	D-26
Q025	A-7
Q026	A-20
Q027	D-24
Q028	F-4
Q030	D-26
Q201	B-17
Q202	B-11
Q203	B-10
Q204	B-10
Q205	C-11
Q206	C-13
Q207	C-13
Q208	A-16
Q209	B-16
Q210	A-18
Q211	A-18
Q212	B-15
Q213	B-13
Q214	A-16
Q215	A-17
Q401	E-24
Q402	F-24
Q403	F-23
Q404	E-23
Q405	A-20
Q406	B-20
Q407	B-20
Q408	C-19
Q409	D-9
Q410	C-9
Q411	C-9
Q412	E-7
Q413	C-9
Q414	D-8
Q415	C-22
Q416	C-22
Q417	C-8
Q418	C-8
Q501	D-6
Q502	E-8
Q601	E-1
Q602	E-27
Q604	D-1
Q605	A-5
Q606	A-1
Q607	A-22
Q608	A-27
Q609	A-1
Q610	A-23
Q611	A-5
Q612	A-23
Q613	A-23
Q614	A-2
Q615	D-1
Q616	D-1
RV001	D-26
RV401	D-28
RV402	D-18
RV601	D-27


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

MB-717 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

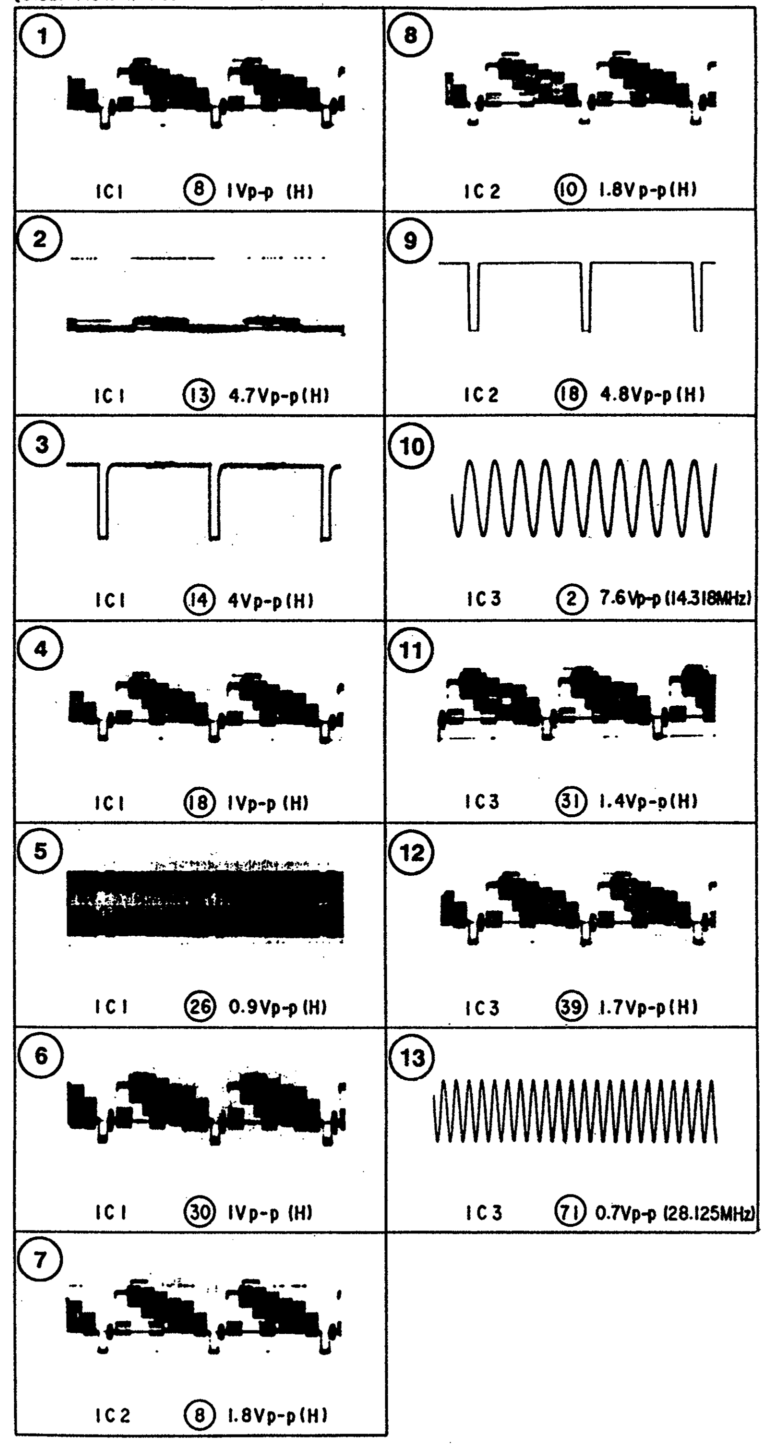
—Ref. No. MB-717 Board; 1,000 Series—

J501
CONTROL S
IC202
DIGITAL OUT
J201
S VIDEO OUT
2
1
J202
LINE OUT 2
VIDEO
L
AUDIO
R
J203
LINE OUT 1
VIDEO
L
AUDIO
R
MB-717 BOARD (CONDUCTOR SIDE)
MB-717 BOARD (COMPONENT SIDE)
A
B
C
D
E
F
G
1-654-457
21
16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27

MB-717 (VIDEO) SCHEMATIC DIAGRAM

—Ref. No. MB-717 Board; 1,000 Series—

MB-717 BOARD(1/4)
no mark : PAUSE mode.
(NTSC REFERENCE DISC (HLV-81)
SIDE1 Frame No.4100)



MB-717 BOARD (1/4)
(VIDEO BLOCK)
J TO (2/4) SERVO BLOCK (See Page 4-17)
RF (V)
RF GND
MTF ON/OFF
A TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
CBG CONT
P CODE
DS GATE
K TO (4/4) AUDIO BLOCK (See Page 4-23)
AUDIO -12V
AUDIO +12V
AUDIO A -5V
AUDIO A +5V
AUDIO A GND
AUDIO B GND
AUDIO B -5V
AUDIO B +5V
G TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-20)
A POWER SUPPLY BLOCK CN051 (See Page 4-42)
Q001 BUFFER
Q003 AMP
Q004 BUFFER
Q002 VTF SWITCH
Q011 LIMITER
Q009, 014 LPF
Q017 LPF
Q027 LPF
Q024 BUFFER
IC001 FM DEMOD, DO DET, SYNC SEP
IC003 A/D, D/A, TBC, DOC
IC004 PB VIDEO/ GRAY BACK SELECTOR
IC005 VIDEO MUTE
IC002 CHARACTER GENERATOR MIX
Q50 SYNC SEP
Q013, 015 SYNC-TIP CLAMP
Q023 BUFFER
Q025, 026 BUFFER
IC601 MEMORY CONTROL
IC602 MEMORY
IC603 Y/C SEP.
IC605 SWITCH
Y/V OUT BUFFER
Y/C MIX
C OUT BUFFER
H TO (2/4) SERVO BLOCK (See Page 4-17)
F TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-20)
A TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
L TO (4/4) AUDIO BLOCK (See Page 4-26)
A TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
M TO (4/4) AUDIO BLOCK (See Page 4-26)

·SIGNAL PATH

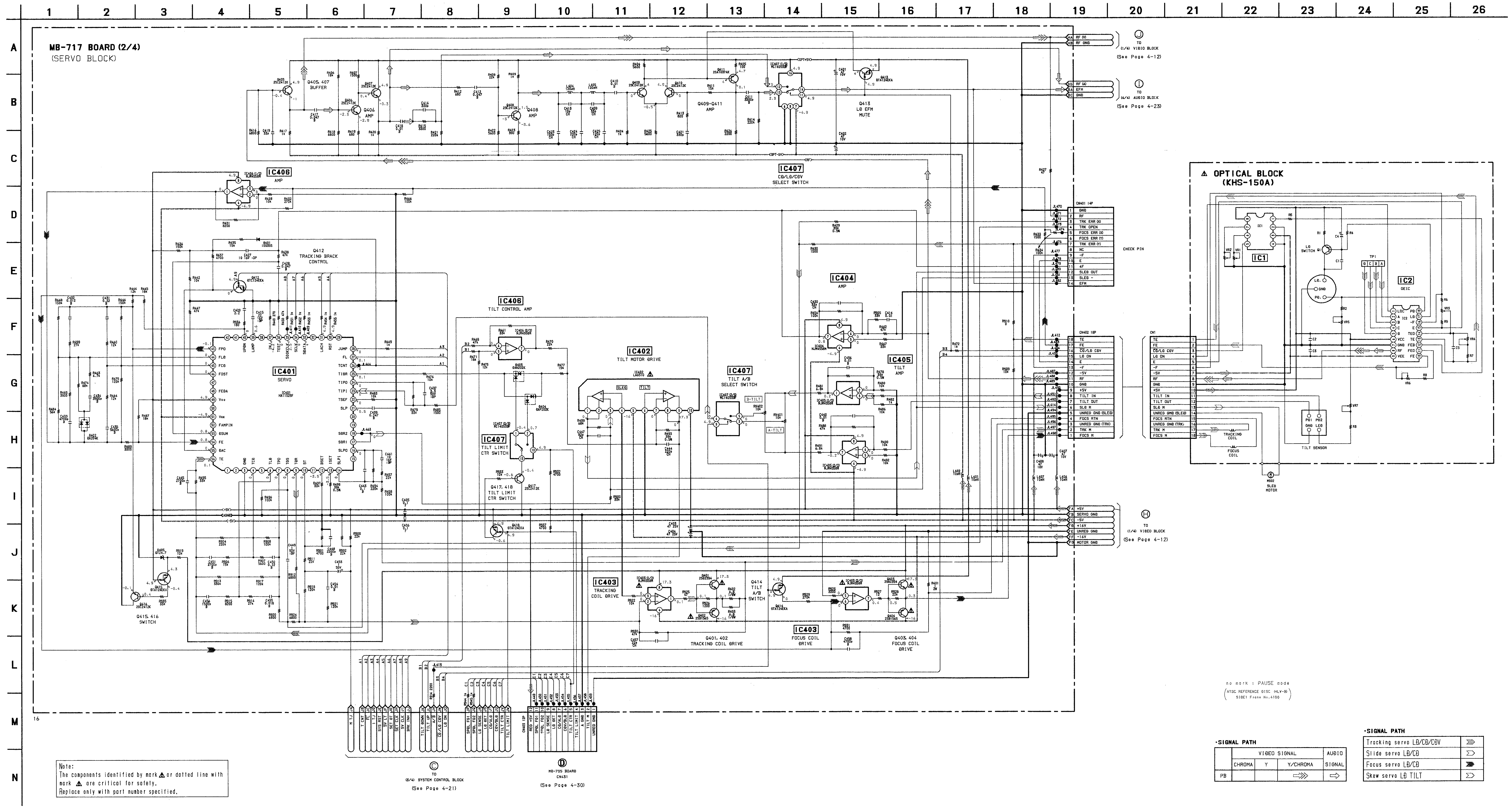
	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
PB	⇨	⇨»	⇨»»	

Spindil servo (speed and phase)	»»

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8)
SIDE1 Frame No.4100)

MB-717 (SERVO) SCHEMATIC DIAGRAM •Refer to page 4-6 for printed wiring board of MB-717 BOARD.

—Ref. No. MB-717 Board; 1,000 Series—


MB-717 BOARD (2/4)
(SERVO BLOCK)
IC401 SERVO
IC402 TILT MOTOR DRIVE
IC403 TRACKING COIL DRIVE
IC403 FOCUS COIL DRIVE
IC404 AMP
IC405 TILT AMP
IC406 AMP
IC406 TILT CONTROL AMP
IC407 CD/LD/CDV SELECT SWITCH
IC407 TILT A/B SELECT SWITCH
IC407 TILT LIMIT CTR SWITCH
Q405, 407 BUFFER
Q406 AMP
Q408 AMP
Q409-Q411 AMP
Q413 LD EFM MUTE
Q412 TRACKING BRACK CONTROL
Q417, 418 TILT LIMIT CTR SWITCH
Q415, 416 SWITCH
Q401, 402 TRACKING COIL DRIVE
Q414 TILT A/B SWITCH
Q403, 404 FOCUS COIL DRIVE
CHECK PIN
⚠ OPTICAL BLOCK (KHS-150A)
IC1
IC2
TILT SENSOR
TRACKING COIL
FOCUS COIL
SLED MOTOR
TO (3/4) VIDEO BLOCK (See Page 4-12)
TO (4/4) AUDIO BLOCK (See Page 4-23)
TO (1/4) VIDEO BLOCK (See Page 4-12)
TO (2/4) SYSTEM CONTROL BLOCK (See Page 4-21)
MG-705 BOARD CN451 (See Page 4-30)
16

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

•SIGNAL PATH

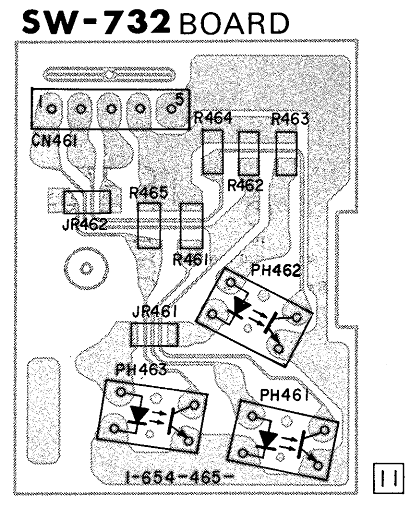
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB			⇨⟫	⇨

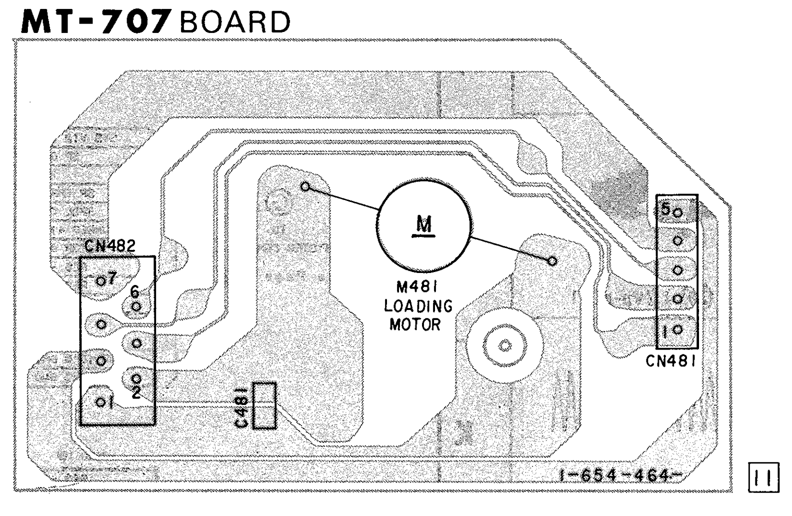
•SIGNAL PATH

Tracking servo LD/CD/CDV	⪢
Slide servo LD/CD	⊳
Focus servo LD/CD	➤
Skew servo LD TILT	⊳

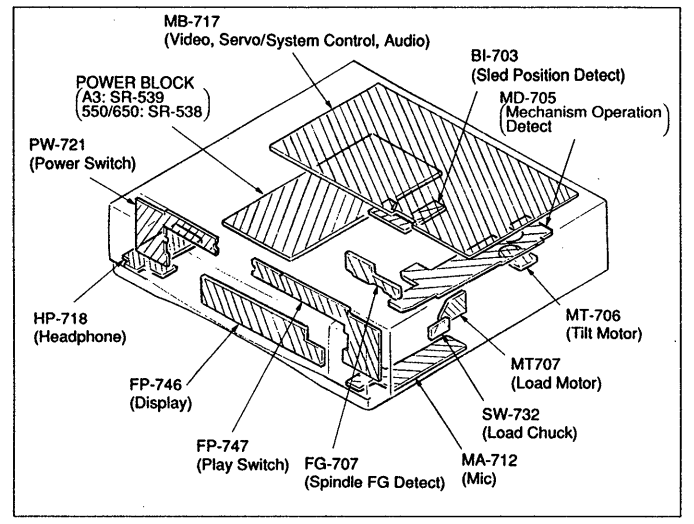
MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) PRINTED WIRING BOARDS

—Ref. No. MT-707 and SW-732 Boards; 4,000 Series—


SW-732 BOARD
CN461
R464
R463
JR462
R465
R462
R461
JR461
PH462
PH463
PH461
1-654-465-
11

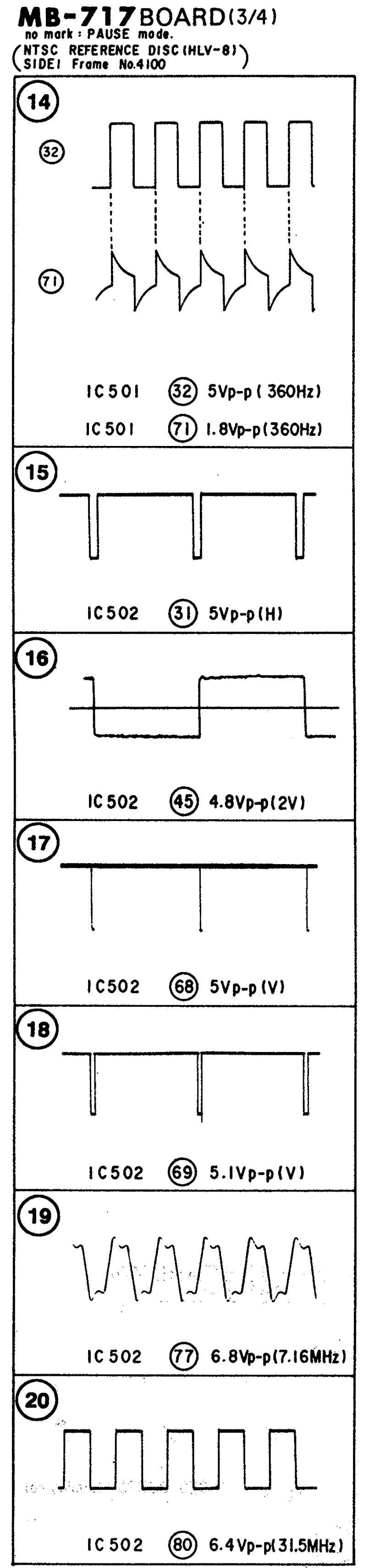

MT-707 BOARD
CN482
M
M481
LOADING
MOTOR
C481
CN481
1-654-464-
11

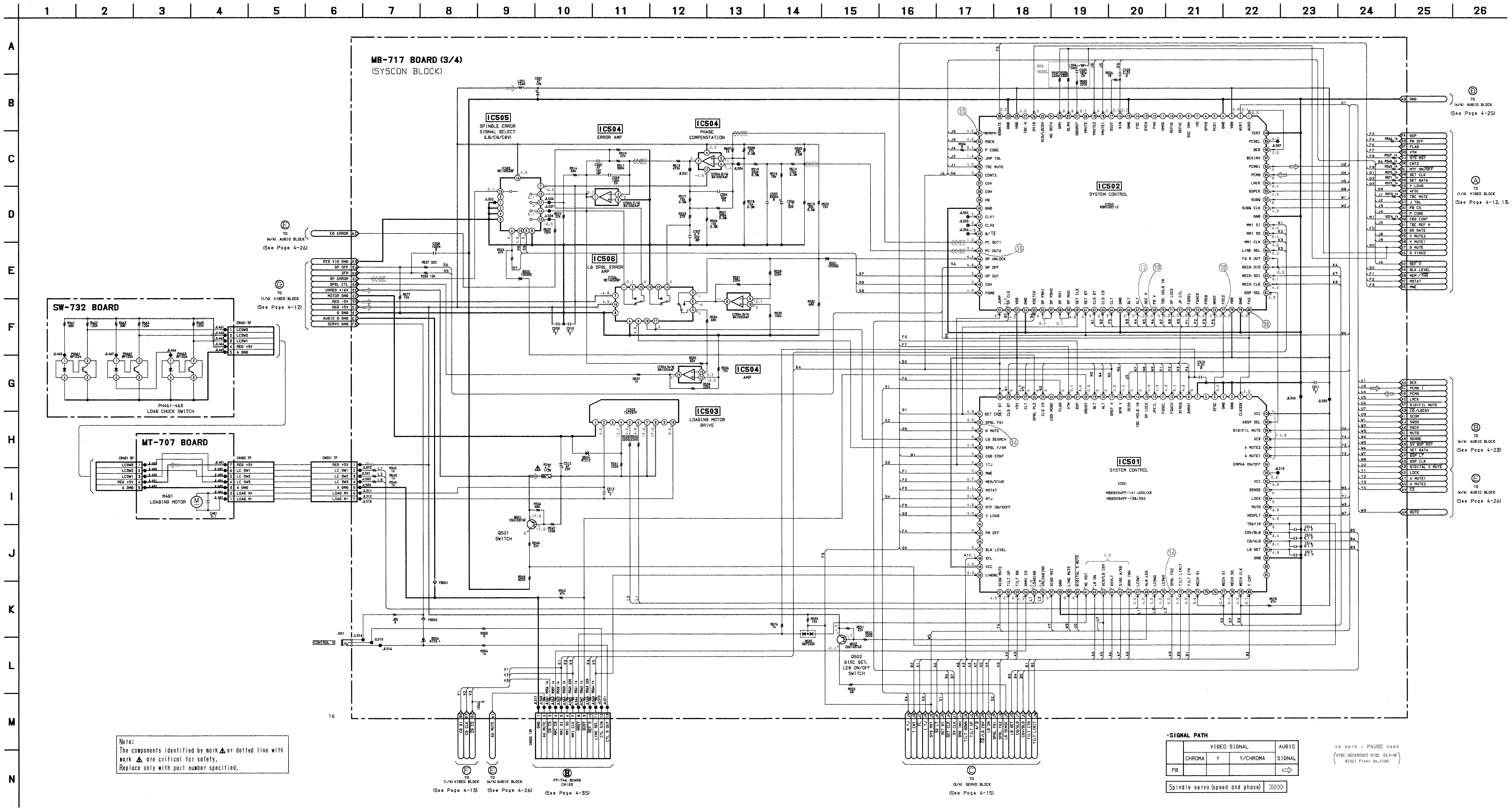
16


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

MB-717 (SYSTEM CONTROL), MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) SCHEMATIC DIAGRAM •Refer to page 4-6 for printed wiring board of MB-717 BOARD.

—Ref. No. MB-717 Board; 1,000 Series, MT-707 and SW-732 Boards; 4,000 Series—




1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
K
L
M
N
MB-717 BOARD (3/4)
(SYSCON BLOCK)
IC505
SPINDLE ERROR SIGNAL SELECT (LD/CD/CDV)
IC504
ERROR AMP
IC504
PHASE COMPENSATION
IC506
LD SPDL ERROR AMP
IC504
AMP
IC503
LOADING MOTOR DRIVE
IC502
SYSTEM CONTROL
IC501
SYSTEM CONTROL
SW-732 BOARD
PH461-463
LOAD CHUCK SWITCH
MT-707 BOARD
M481
LOADING MOTOR
Q501
SWITCH
Q502
DISC DET. LED ON/OFF SWITCH
TO (4/4) AUDIO BLOCK (See Page 4-26)
TO (1/4) VIDEO BLOCK (See Page 4-12)
TO (4/4) AUDIO BLOCK (See Page 4-25)
TO (1/4) VIDEO BLOCK (See Page 4-12, 13, 14)
TO (4/4) AUDIO BLOCK (See Page 4-23)
TO (4/4) AUDIO BLOCK (See Page 4-26)
TO (1/4) VIDEO BLOCK (See Page 4-13)
TO (4/4) AUDIO BLOCK (See Page 4-26)
FP-746 BOARD CN103 (See Page 4-35)
TO (2/4) SERVO BLOCK (See Page 4-15)
CONTROL S
16

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB				⇨

Spindle servo (speed and phase)	»»

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

MB-717 (AUDIO), MA-712 (MIC) , HP-718(HEADPHONE) SCHEMATIC DIAGRAM •Refer to page 4-6 for MB-717 board printed wiring board. •Refer to page 4-4 for MA-712/HP-718 boards printed wiring board.

—Ref. No. MB-717 Board; 1,000 Series, MA-712 and HP-718 Boards; 3,000 Series —

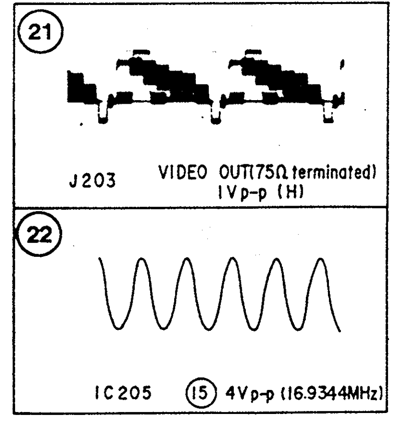
MB-717 BOARD (4/4)
(AUDIO BLOCK)
IC201 AUDIO D.S.P
IC202
IC203 AFM DEMOD EX NR
IC204 CD SPINDLE ERROR.AMP
IC205 DIGIFIL & DAC
IC206 BUFFER
IC207 AMP
Q201, 202 AUDIO MUTE SWITCH
Q203, 204 AMP
Q205 MUTE SWITCH
Q206 INVERTER
Q207 CD/LD CSV SWITCH
Q214, 215 MUTE
Q210, 211 MUTE
650/A3 MODELS
TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
TO (2/4) SERVO BLOCK (See Page 4-17)
TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-20, 22)
TO (1/4) VIDEO BLOCK (See Page 4-12)
TO (1/4) VIDEO BLOCK (See Page 4-14)
TO HP
TO VIDEO
DIGITAL OUT
LINE OUT1
LINE OUT2
HP-718 BOARD
PHONES
LEVEL
MA-712 BOARD
IC501 ECHO AMP
IC502 MIC AMP
IC503 MIC AMP
IC504 REG.
RV501 ECHO MIC LEVEL
MIC

·SIGNAL PATH

	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
PB	⇨	⇨»	⇨»»	⇨

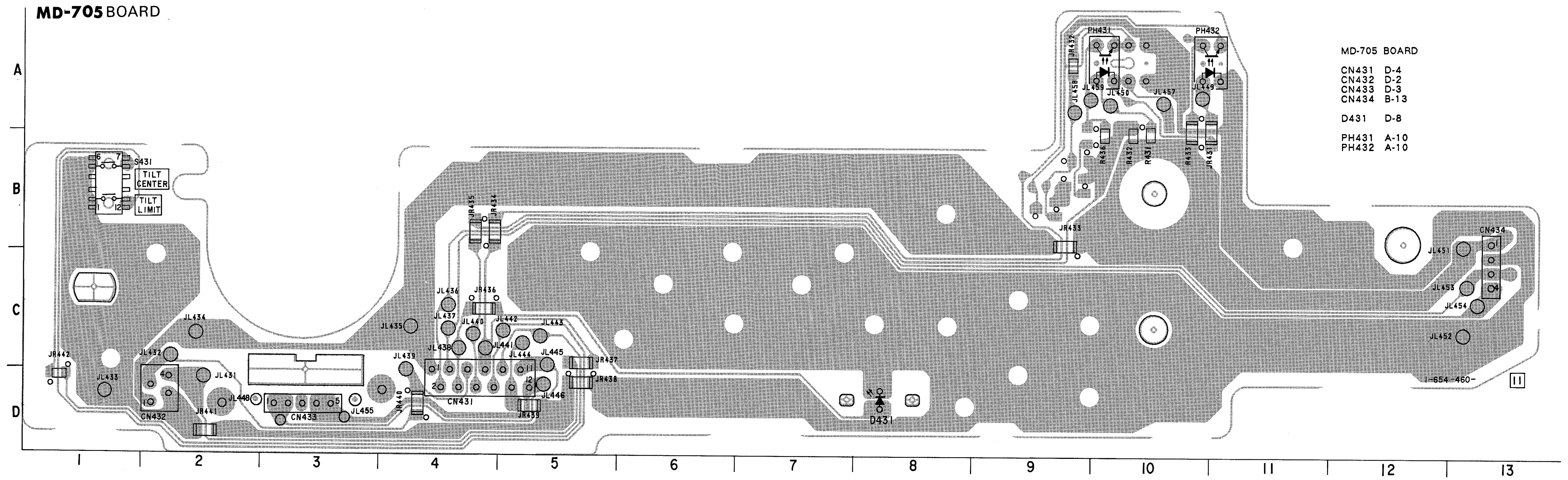
no mark : PLAY mode
(NTSC REFERENCE DISC (HLV-8)
SIDE2 Chapter Track No.16)

MB-717BOARD(4/4)
no mark : PAUSE mode.
(NTSC REFERENCE DISC(HLV-8)
SIDE1 Frame No.4100)



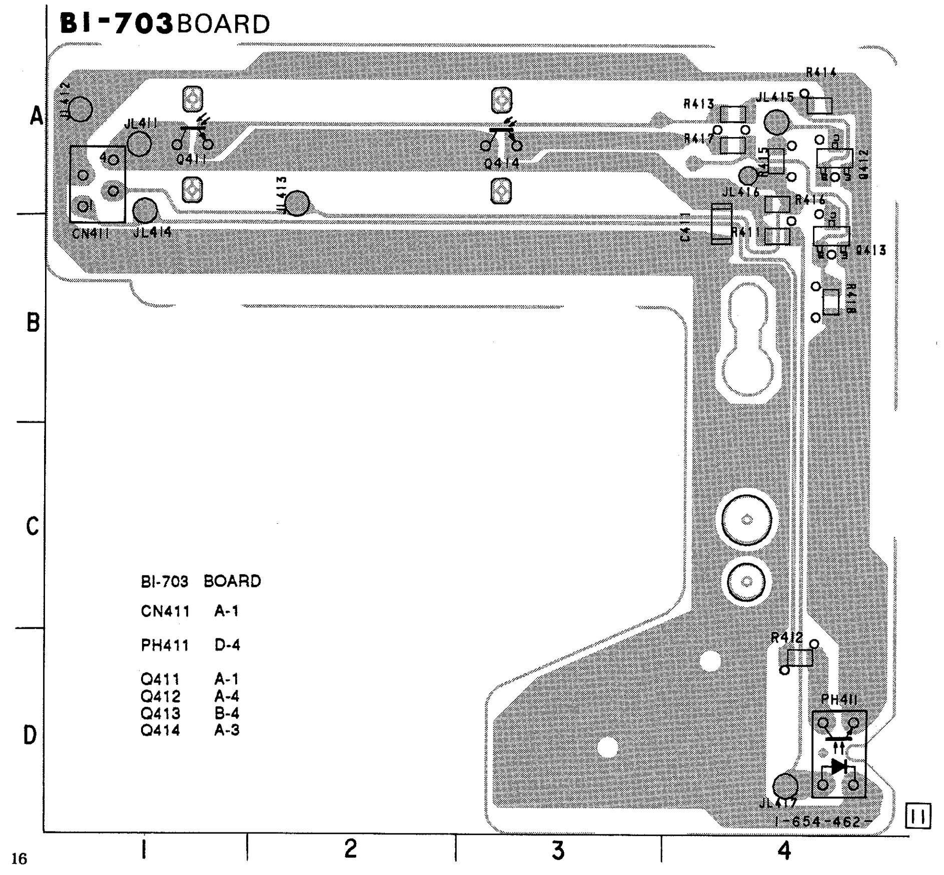
BI-703, MD-705 (MECHANISM OPERATION DETECT), FG-707 (SPINDLE FG DETECT), MT-706 (TILT MOTOR) PRINTED WIRING BOARDS

—Ref. No. BI-703, MD-705, FG-707 and MT-706 Boards; 2,000 Series—


MD-705 BOARD
A
B
C
D
1
2
3
4
5
6
7
8
9
10
11
12
13
S431
TILT CENTER
TILT LIMIT
PH431
PH432
CN431
CN432
CN433
CN434
D431
JL443
1-654-460-
11

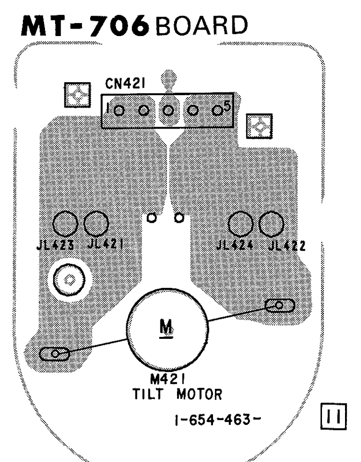
MD-705 BOARD

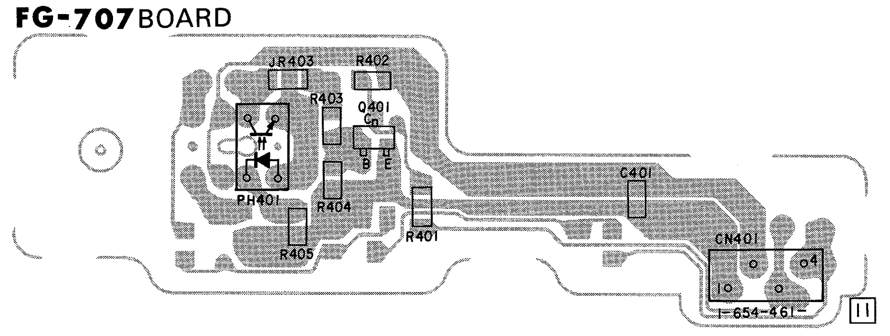
CN431	D-4
CN432	D-2
CN433	D-3
CN434	B-13
D431	D-8
PH431	A-10
PH432	A-10

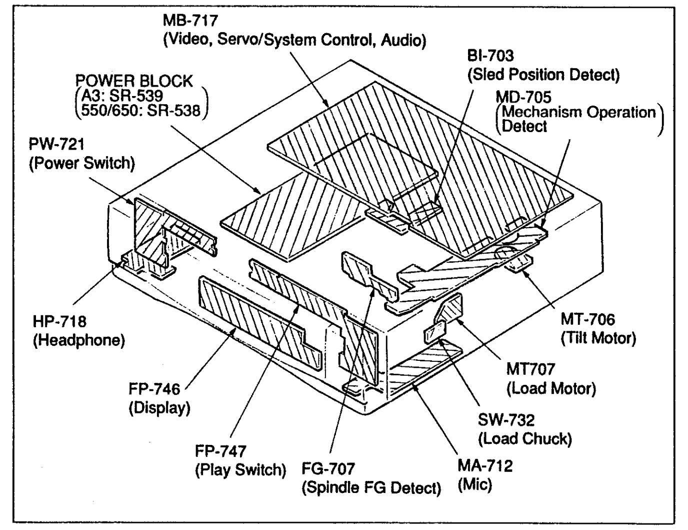

BI-703BOARD
A
B
C
D
1
2
3
4
CN411
JL411
JL414
R413
R414
R415
Q414
PH411
JL417
1-654-462-
11
16

BI-703 BOARD

CN411	A-1
PH411	D-4
Q411	A-1
Q412	A-4
Q413	B-4
Q414	A-3

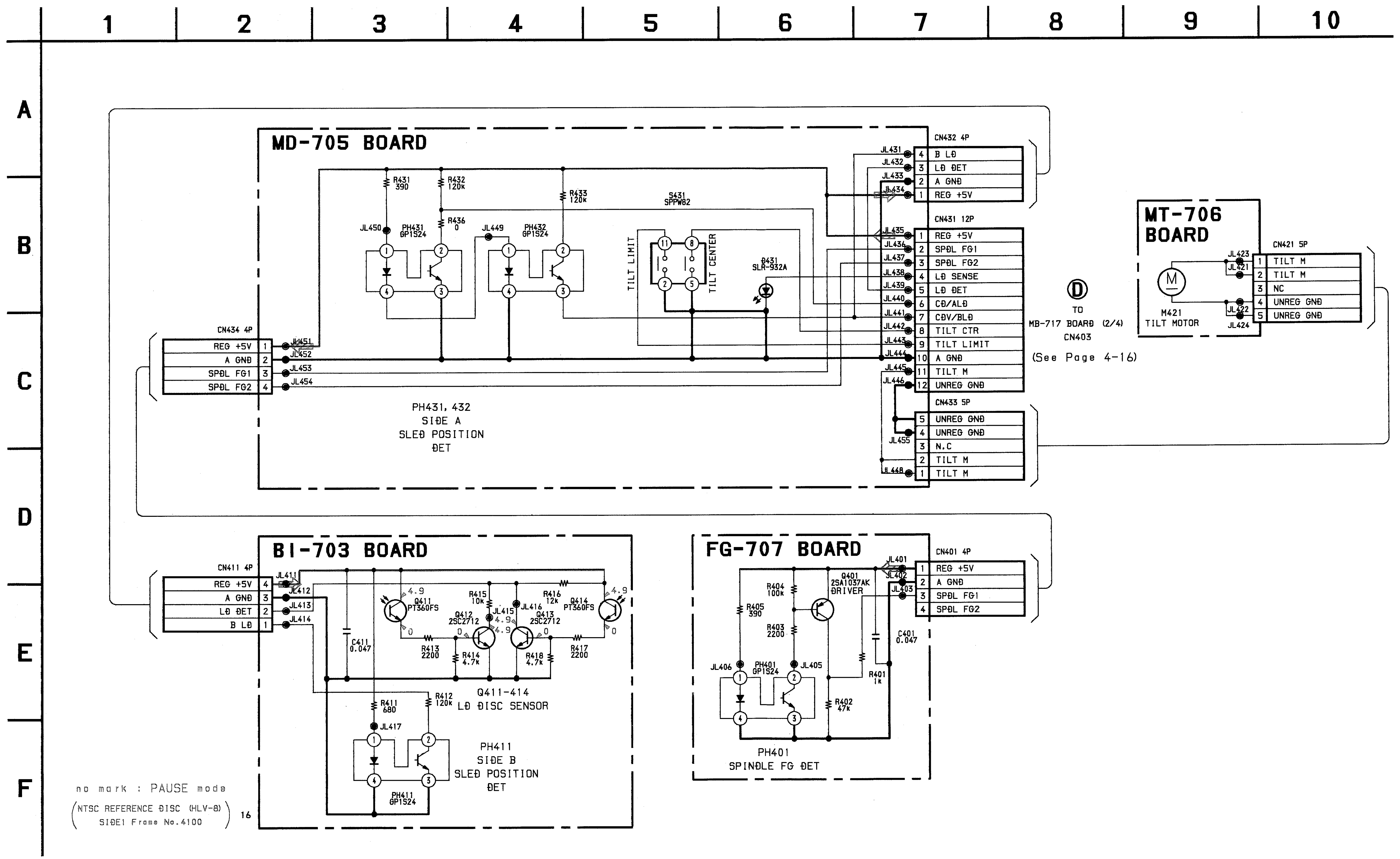

MT-706 BOARD
CN421
JL423
JL421
JL424
JL422
M
M421
TILT MOTOR
1-654-463-
11


FG-707 BOARD
JR403
R402
Q401
PH401
R405
R404
R401
C401
CN401
1-654-461-
11


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

BI-703, MD-705 (MECHANISM OPERATION DETECT), FG-707 (SPINDLE FG DETECT), MT-706 (TILT MOTOR) SCHEMATIC DIAGRAM

—Ref. No. BI-703, MD-705, FG-707 and MT-706 Boards; 2,000 Series—


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
MD-705 BOARD
R431 390
R432 120k
R433 120k
R436 0
JL450
PH431 GP1S24
JL449
PH432 GP1S24
S431 SPPW82
TILT LIMIT
TILT CENTER
D431 SLR-932A
CN434 4P
1 REG +5V
2 A GND
3 SPDL FG1
4 SPDL FG2
JL451
JL452
JL453
JL454
PH431, 432
SIDE A
SLED POSITION
DET
CN432 4P
4 B LD
3 LD DET
2 A GND
1 REG +5V
JL431
JL432
JL433
JL434
CN431 12P
1 REG +5V
2 SPDL FG1
3 SPDL FG2
4 LD SENSE
5 LD DET
6 CD/ALD
7 CDV/BLD
8 TILT CTR
9 TILT LIMIT
10 A GND
11 TILT M
12 UNREG GND
JL435
JL436
JL437
JL438
JL439
JL440
JL441
JL442
JL443
JL444
JL445
JL446
CN433 5P
5 UNREG GND
4 UNREG GND
3 N.C
2 TILT M
1 TILT M
JL455
JL448
D
TO
MB-717 BOARD (2/4)
CN403
(See Page 4-16)
MT-706
BOARD
M
M421
TILT MOTOR
CN421 5P
1 TILT M
2 TILT M
3 NC
4 UNREG GND
5 UNREG GND
JL423
JL421
JL422
JL424
BI-703 BOARD
CN411 4P
4 REG +5V
3 A GND
2 LD DET
1 B LD
JL411
JL412
JL413
JL414
C411 0.047
Q411 PT360FS
Q412 2SC2712
Q413 2SC2712
Q414 PT360FS
R413 2200
R414 4.7k
R415 10k
R416 12k
R417 2200
R418 4.7k
JL415
JL416
4.9
0
R411 680
R412 120k
JL417
Q411-414
LD DISC SENSOR
PH411 GP1S24
PH411
SIDE B
SLED POSITION
DET
FG-707 BOARD
CN401 4P
1 REG +5V
2 A GND
3 SPDL FG1
4 SPDL FG2
JL401
JL402
JL403
R404 100k
R405 390
R403 2200
Q401 2SA1037AK DRIVER
C401 0.047
R401 1k
R402 47k
JL406
JL405
PH401 GP1S24
PH401
SPINDLE FG DET

no mark : PAUSE mode

(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

16

FP-746 BOARD

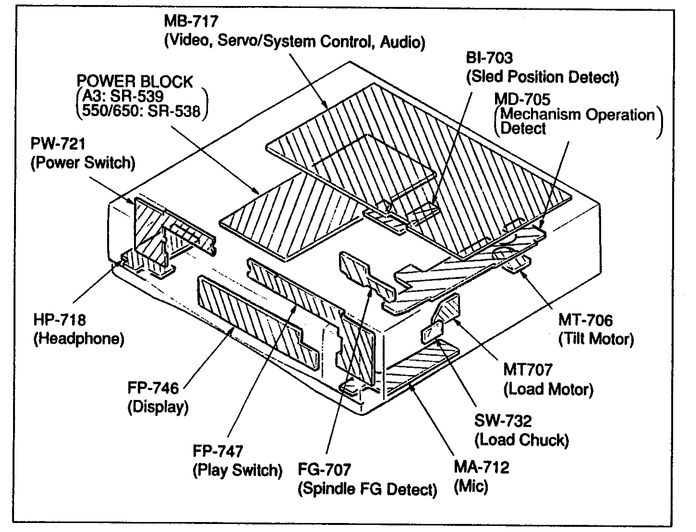
CN101	C-18
CN101	G-18
CN102	E-8
CN103	A-18
CN105	A-7
D101	G-10
D102	G-10
D103	G-9
D104	G-10
D105	G-9
D106	D-17
IC101	H-16
IC102	G-14
IC103	G-12
Q101	C-10
Q102	G-10
Q103	F-17
Q104	D-16
Q105	C-17
Q106	C-17
Q107	C-17
Q108	C-17
Q109	D-17

FP-747 BOARD

CN201	G-1
D201	I-6
D202	I-11
D203	I-10
D204	H-1
D205	H-2

PW-721 BOARD

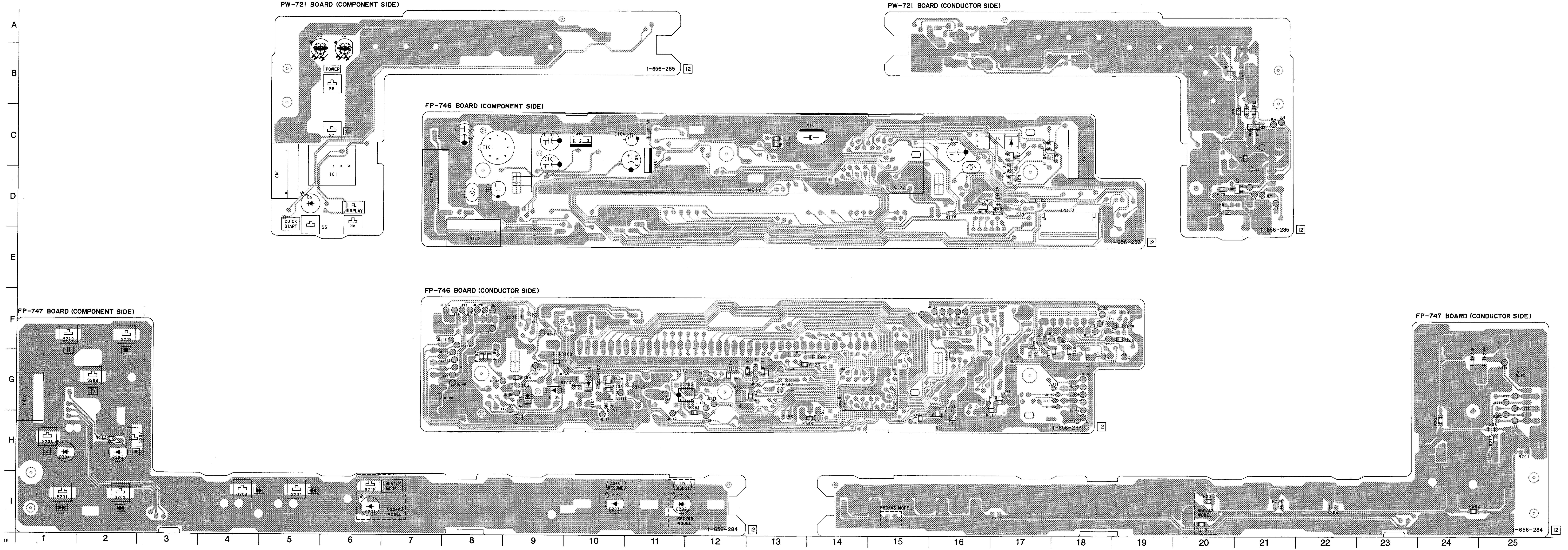
CN001	D-5
D002	B-6
D003	B-5
D006	D-5
IC001	C-6
Q002	D-21
Q003	C-21


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

FRONT

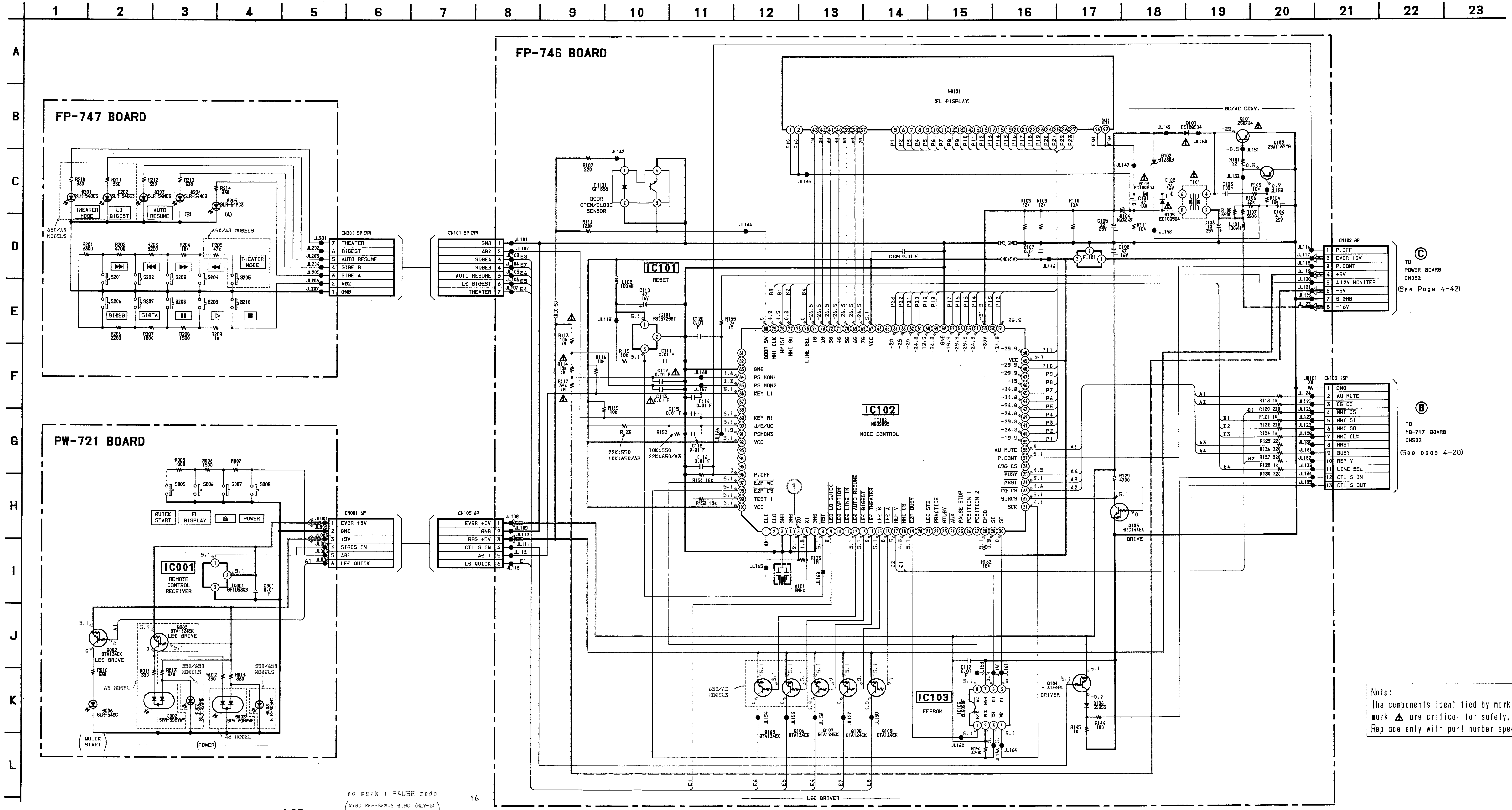
FP-746 (DISPLAY), FP-747 (PLAY SWITCH), PW-721 (POWER SWITCH) PRINTED WIRING BOARDS

—Ref. No. FP-746, FP-747 and PW-721 Board; 3,000 Series—


PW-721 BOARD (COMPONENT SIDE)
PW-721 BOARD (CONDUCTOR SIDE)
FP-746 BOARD (COMPONENT SIDE)
FP-746 BOARD (CONDUCTOR SIDE)
FP-747 BOARD (COMPONENT SIDE)
FP-747 BOARD (CONDUCTOR SIDE)
POWER
QUICK START
FL DISPLAY
THEATER MODE
AUTO RESUME
LD DIGEST
650/A3 MODEL
1-656-285
1-656-283
1-656-284
12
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

FP-746 (DISPLAY), FP-747 (PLAY SWITCH), PW-721 (POWER SWITCH) SCHEMATIC DIAGRAMS

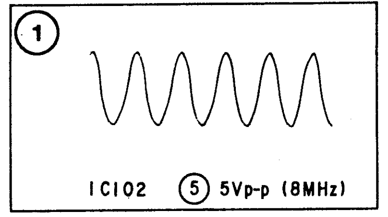
—Ref. No. FP-746, FP-747 and PW-721 Board; 3,000 Series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
K
L
FP-746 BOARD
FP-747 BOARD
PW-721 BOARD
THEATER MODE
LD DIGEST
AUTO RESUME
650/A3 MODELS
SIDEB
SIDEA
CN201 5P (7P)
7 THEATER
6 DIGEST
5 AUTO RESUME
4 SIDE B
3 SIDE A
2 AD2
1 GND
CN101 5P (7P)
1 GND
2 AD2
3 SIDEA
4 SIDEB
5 AUTO RESUME
6 LD DIGEST
7 THEATER
QUICK START
FL DISPLAY
POWER
IC001
REMOTE CONTROL RECEIVER
LED DRIVE
A3 MODEL
550/650 MODELS
CN001 6P
1 EVER +5V
2 GND
3 +5V
4 SIRCS IN
5 AD1
6 LED QUICK
CN105 6P
1 EVER +5V
2 GND
3 REG +5V
4 CTL S IN
5 AD 1
6 LD QUICK
QUICK START
POWER
ND101
FL DISPLAY
DOOR OPEN/CLOSE SENSOR
DC/AC CONV.
IC101
RESET
IC102
IC102 MB89095
MODE CONTROL
GND
PS MON1
PS MON2
KEY L1
KEY R1
J/E/UC
PSMON3
VCC
P.OFF
E2P WC
E2P CS
TEST 1
VCC
DOOR SW
MMI CLK
MMISI
MMI SO
LINE SEL
AU MUTE
P.CONT
CDG CS
BUSY
MRST
CG CS
SIRCS
SCK
CLI
CLO
XO
XI
RST
LED LD QUICK
LED CAPTION
LED LINE IN
LED AUTO RESUME
LED DIGEST
LED THEATER
LED B
LED A
REF V
MMI CS
E2P BUSY
LED STB
PRACTICE
STUDY
AUX
PAUSE STOP
POSITION 1
POSITION 2
CMOD
SI
SO
22K:550
10K:A3
10K:550
22K:650/A3
IC103
EEPROM
DRIVE
LED DRIVER
650/A3 MODELS
CN102 8P
1 P.OFF
2 EVER +5V
3 P.CONT
4 +5V
5 ±12V MONITER
6 -5V
7 D GND
8 -16V
Ⓒ
TO
POWER BOARD
CN052
(See Page 4-42)
CN103 13P
1 GND
2 AU MUTE
3 CG CS
4 MMI CS
5 MMI SI
6 MMI SO
7 MMI CLK
8 MRST
9 BUSY
10 REF V
11 LINE SEL
12 CTL S IN
13 CTL S OUT
Ⓑ
TO
MB-717 BOARD
CN502
(See page 4-20)

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8)
SIDE1 Frame No.4100)

16

FP-746 BOARD
no mark : PAUSE mode.
(NTSC REFERENCE DISC (HLV-8)
SIDE1 Frame No.4100)



Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

FRONT

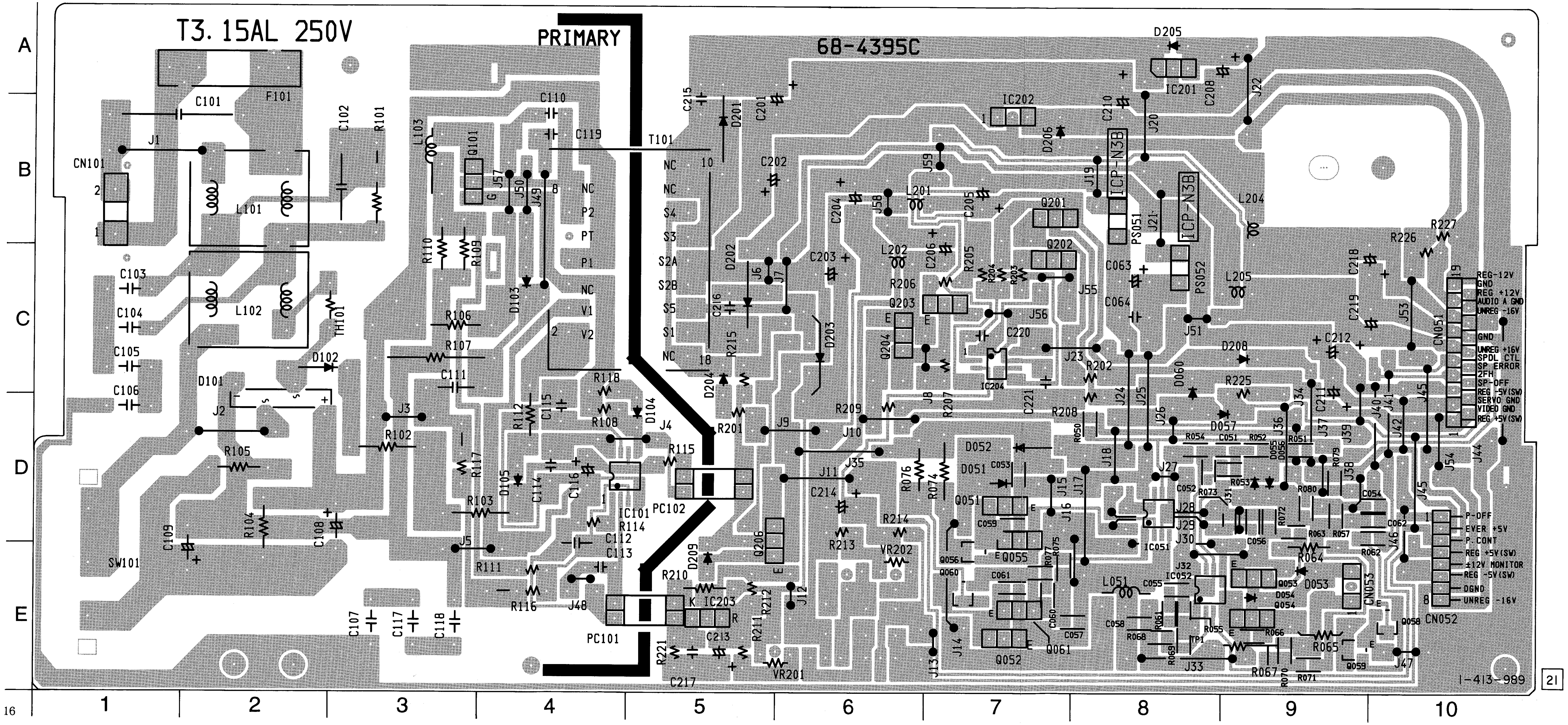
POWER BLOCK SR-539 PRINTED WIRING BOARDS (MDP-A3 MODEL)

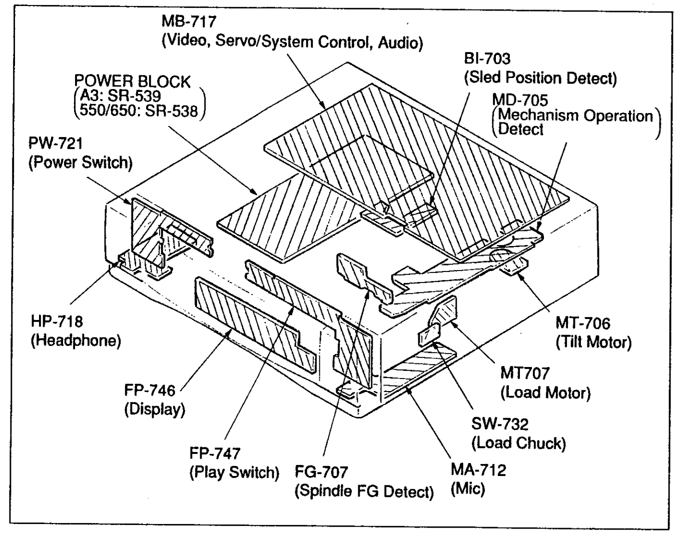
—Ref. No. POWER BLOCK; 5,000 Series—

POWER BLOCK (A3)

CN051	C–10
CN052	E–10
CN053	E–9
CN101	B–1
D051	D–7
D052	D–7
D053	E–9
D054	E–9
D055	D–9
D056	D–9
D057	D–9
D060	C–8
D101	D–2
D102	C–2
D103	C–4
D104	D–5
D105	D–4
D201	B–5
D202	C–5
D203	C–6
D204	C–5
D205	A–8
D206	B–7
D208	C–9
D209	E–5
IC051	D–8
IC052	E–8
IC101	D–5
IC201	A–8
IC202	B–7
IC203	E–5
IC204	C–7
Q051	D–7
Q052	E–7
Q053	E–9
Q054	E–9
Q055	D–7
Q056	E–7
Q058	E–10
Q059	E–9
Q060	E–7
Q061	E–7
Q101	B–3
Q201	B–7
Q202	C–7
Q203	C–7
Q204	C–6
Q206	D–5
VR201	E–6
VR202	E–6

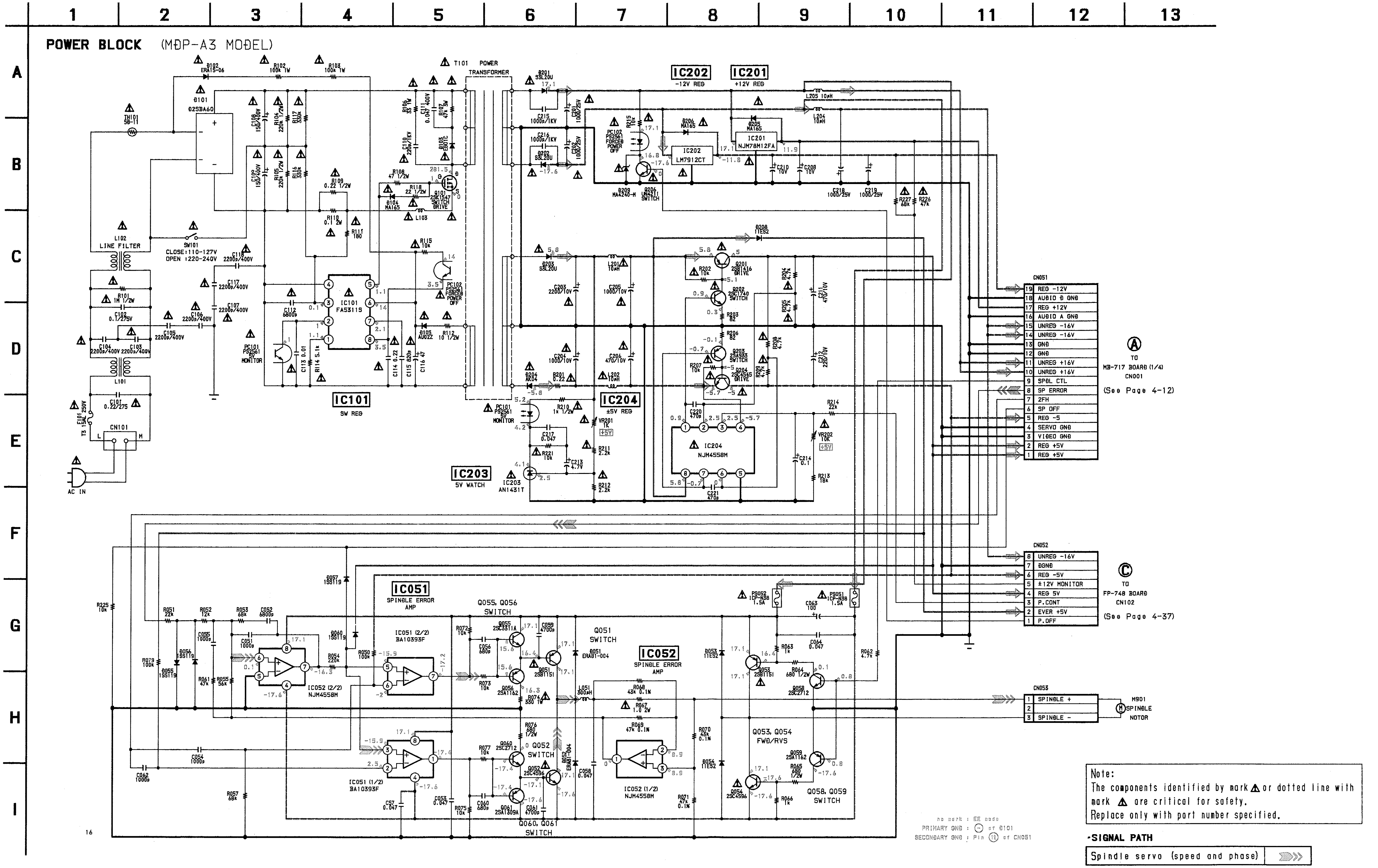
POWER BLOCK (A3 MODEL)


T3.15AL 250V
PRIMARY
68-4395C
F101
C101
C102
R101
J1
CN101
L101
L102
C103
C104
C105
C106
TH101
D101
D102
J2
J3
R102
R105
R104
C109
C108
SW101
C107
C117
C118
L103
Q101
C110
C119
T101
R110
R109
D103
R106
R107
C111
R118
R108
D104
J4
R112
C115
R115
R117
D105
C114
C116
IC101
R114
C112
C113
R103
J5
R111
R116
J48
PC102
PC101
R210
D209
IC203
C213
R221
C217
R211
R212
VR201
J12
J13
J14
C215
D201
C201
C202
C204
C203
D202
J6
J7
C216
R215
D203
D204
R201
R209
J9
J10
J11
J35
C214
R213
R214
VR202
Q206
IC202
L201
L202
C205
C206
R205
R206
Q203
Q204
J8
R207
R208
J58
J59
Q201
Q202
R204
R203
J55
J56
C220
IC204
C221
J23
R202
D052
D051
Q051
Q055
Q052
Q061
Q056
Q060
C059
C053
C060
C061
C057
R076
R074
R075
R077
J15
J16
J17
J18
D205
IC201
C208
C210
D206
J19
J20
J21
J22
ICP-N3B
PS051
PS052
C063
C064
J51
L204
L205
R226
R227
C218
C219
J53
CN051
D208
C212
C211
D060
R225
D057
J24
J25
J26
J27
J28
J29
J30
J31
J32
J33
J34
J36
J37
J38
J39
J40
J41
J42
J44
J45
J46
J47
J54
R050
R051
R052
R053
R054
R055
R057
R062
R063
R064
R065
R066
R067
R068
R069
R070
R071
R072
R073
R079
R080
R081
C051
C052
C054
C055
C056
C058
C062
IC051
IC052
L051
D053
D054
D055
D056
Q053
Q054
Q058
Q059
CN053
CN052
TP1
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
1-413-989
21
A
B
C
D
E
1
2
3
4
5
6
7
8
9
10
16


MB-717
(Video, Servo/System Control, Audio)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
FP-746
(Display)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)
SW-732
(Load Chuck)
MT707
(Load Motor)
MT-706
(Tilt Motor)

POWER BLOCK SR-539 SCHEMATIC DIAGRAMS (MDP-A3 MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—


1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I
POWER BLOCK (MDP-A3 MODEL)
T101 POWER TRANSFORMER
IC202 -12V REG
IC201 +12V REG
IC101 5V REG
IC203 5V WATCH
IC204 ±5V REG
IC051 SPINDLE ERROR AMP
IC052 SPINDLE ERROR AMP
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
Q060, Q061 SWITCH
LINE FILTER
SW101 CLOSE:110-127V OPEN :220-240V
AC IN
CN101
CN051
19 REG -12V
18 AUDIO D GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001 (See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-748 BOARD CN102 (See Page 4-37)
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑬ of CN051

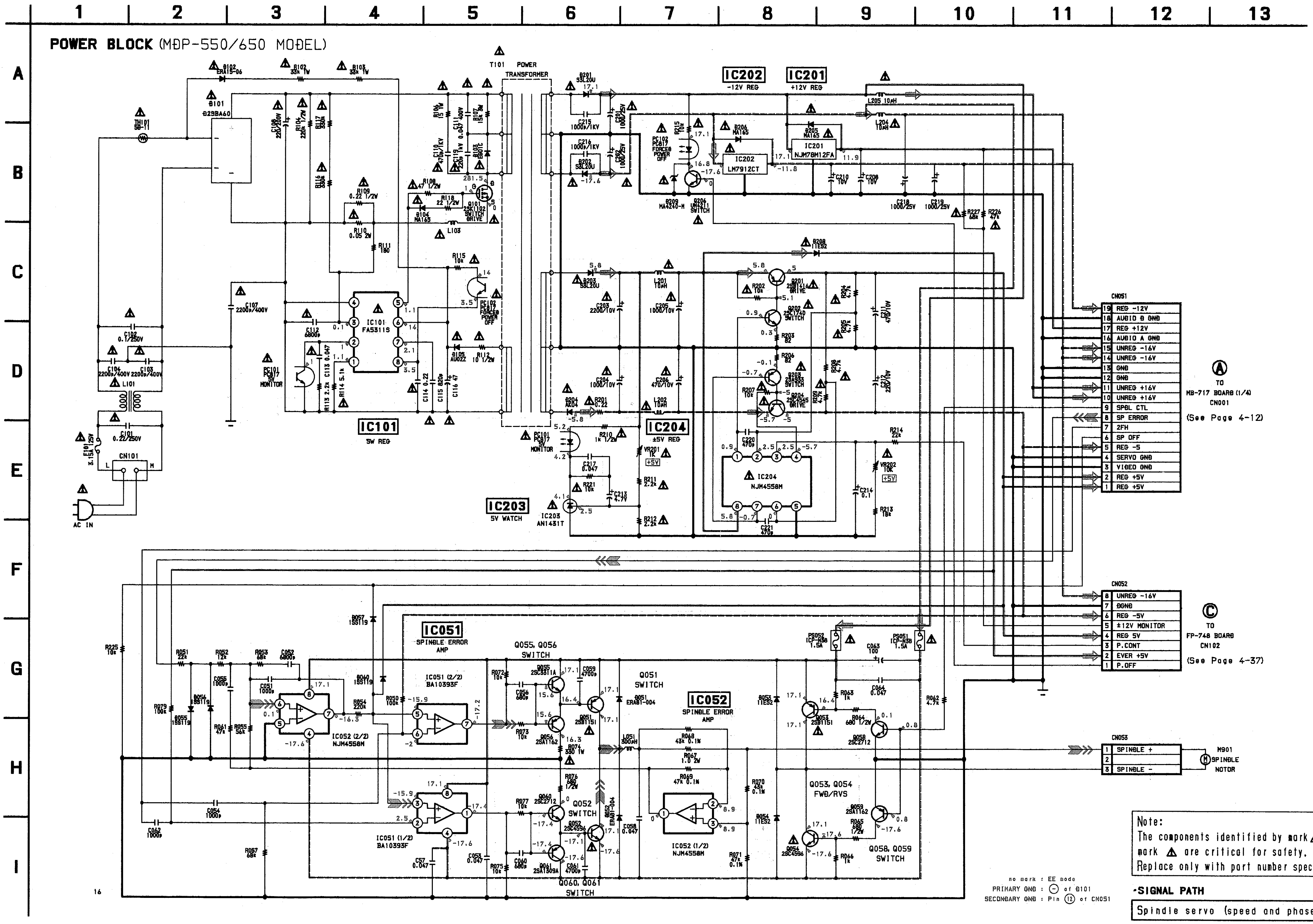
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

·SIGNAL PATH

Spindle servo (speed and phase)	⋙

POWER BLOCK SR-538 SCHEMATIC DIAGRAMS (MDP-550/650 MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
POWER BLOCK (MDP-550/650 MODEL)
T101 POWER TRANSFORMER
IC202 -12V REG
IC201 +12V REG
IC202 LM7912CT
IC201 NJM78M12FA
IC101 SW REG
IC101 FA5311S
IC204 ±5V REG
IC204 NJM4558M
IC203 5V WATCH
IC203 AN1431T
IC051 SPINDLE ERROR AMP
IC051 (2/2) BA10393F
IC051 (1/2) BA10393F
IC052 SPINDLE ERROR AMP
IC052 (2/2) NJM4558M
IC052 (1/2) NJM4558M
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q060, Q061 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
Q101 2SK1102 SWITCH DRIVE
PC101 PC817 5V MONITOR
PC102 PC817 FORCED POWER OFF
D101 D2SBA60
TH101
F101 3.15A 125V
CN101
L101
AC IN
CN051
19 REG -12V
18 AUDIO B GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001
(See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-748 BOARD CN102
(See Page 4-37)
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051
16

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

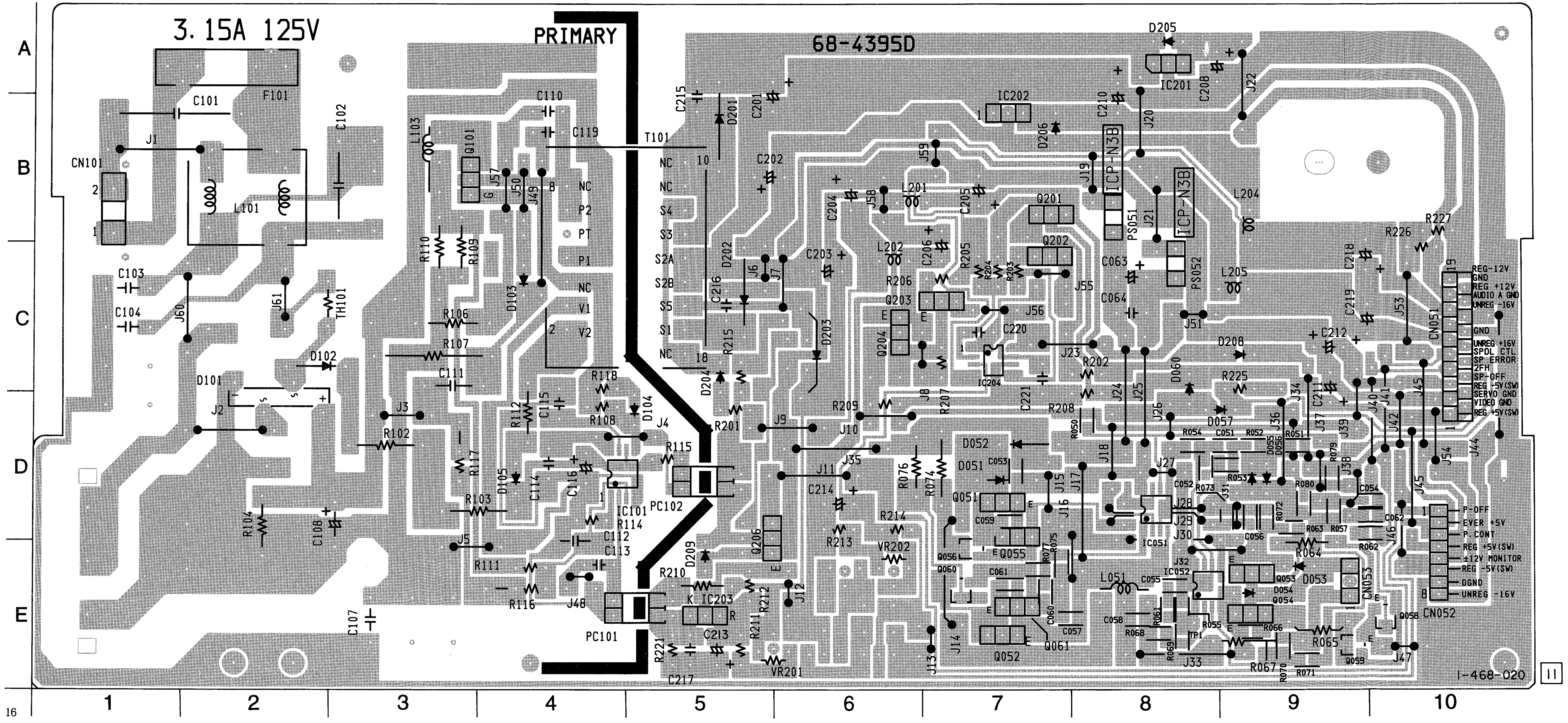
·SIGNAL PATH

Spindle servo (speed and phase)	⇛》

POWER BLOCK SR-538 PRINTED WIRING BOARDS (MDP-550/650 MODEL)

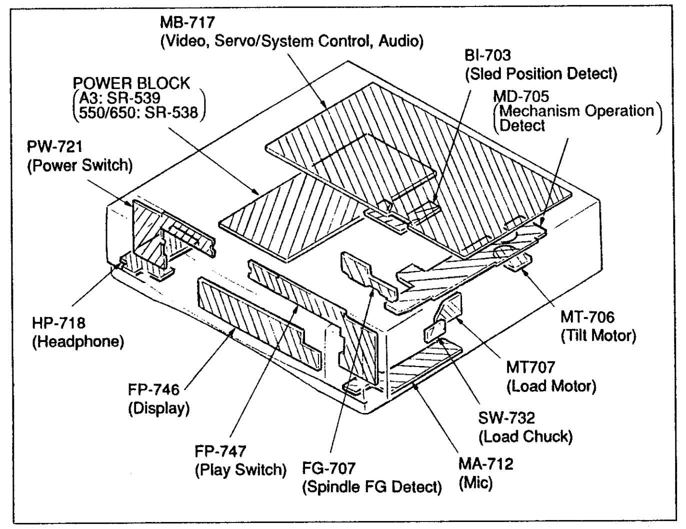
—Ref. No. POWER BLOCK; 5,000 Series—

POWER BLOCK (550/650 MODEL)


3. 15A 125V
PRIMARY
68-4395D
F101
C101
C102
CN101
L101
J1
C103
C104
J60
J61
TH101
D101
D102
J2
C107
C108
R104
J3
R102
L103
Q101
J57
J50
J49
R110
R109
D103
R106
R107
C111
C110
C119
T101
NC
10
S4
S3
S2A
S2B
S5
S1
18
B
P2
PT
P1
V1
V2
R118
R108
D104
J4
R112
C115
R117
D105
C114
C116
IC101
R114
C112
C113
R103
J5
R111
R116
J48
PC101
PC102
R115
R201
D209
R210
IC203
C213
R211
R212
R221
C217
VR201
C215
D201
C201
C202
D202
C216
R215
D204
J6
J7
C203
D203
Q204
Q203
R206
C204
J58
J59
L201
L202
C206
C205
R205
R204
R203
IC202
Q201
Q202
J55
J56
C220
IC204
C221
R207
J8
R209
J9
J10
J11
J35
C214
R213
R214
VR202
Q206
J12
J13
J14
R076
R074
D052
D051
C053
Q051
C059
Q055
Q056
Q060
C061
R077
R075
C060
Q052
Q061
C057
J15
J16
J17
J18
D206
C210
ICP-N3B
PS051
PS052
J19
J20
J21
C063
C064
J23
R202
J24
J25
D060
J26
R208
R050
IC201
D205
C208
J22
L204
L205
D208
R225
D057
C212
C218
C219
R226
R227
J53
J51
R054
C051
R052
R051
D055
D056
R053
J27
C052
R073
J28
J29
J30
IC051
J31
J32
IC052
L051
C055
C056
R072
R063
R057
R064
R080
C054
R062
C062
J34
J36
J37
J38
J39
J40
J41
J42
J43
J44
J45
J46
J47
J52
J54
C211
R079
D053
D054
Q053
Q054
CN053
CN051
CN052
Q058
Q059
R065
R066
R067
R070
R071
R055
R068
R069
R061
C058
TP1
J33
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG +5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
1-468-020
11
A
B
C
D
E
1
2
3
4
5
6
7
8
9
10
16

POWER BLOCK
(550/650)

CN051	C-10	IC051	D-8
CN052	E-10	IC052	E-8
CN053	E-9	IC101	D-5
CN101	B-1	IC201	A-8
		IC202	B-7
D051	D-7	IC203	E-5
D052	D-7	IC204	C-7
D053	E-9		
D054	E-9	Q051	D-7
D055	D-9	Q052	E-7
D056	D-9	Q053	E-9
D057	D-9	Q054	E-9
D060	C-8	Q055	D-7
D101	D-2	Q056	E-7
D102	C-2	Q058	E-10
D103	C-4	Q059	E-9
D104	D-5	Q060	E-7
D105	D-4	Q061	E-7
D201	B-5	Q101	B-3
D202	C-5	Q201	B-7
D203	C-6	Q202	C-7
D204	C-5	Q203	C-7
D205	A-8	Q204	C-6
D206	B-7	Q206	D-5
D208	C-9		
D209	E-5	VR201	E-6
		VR202	E-6


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation
Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

SECTION 5
REPAIR PARTS LIST

5-1. EXPLODED VIEWS

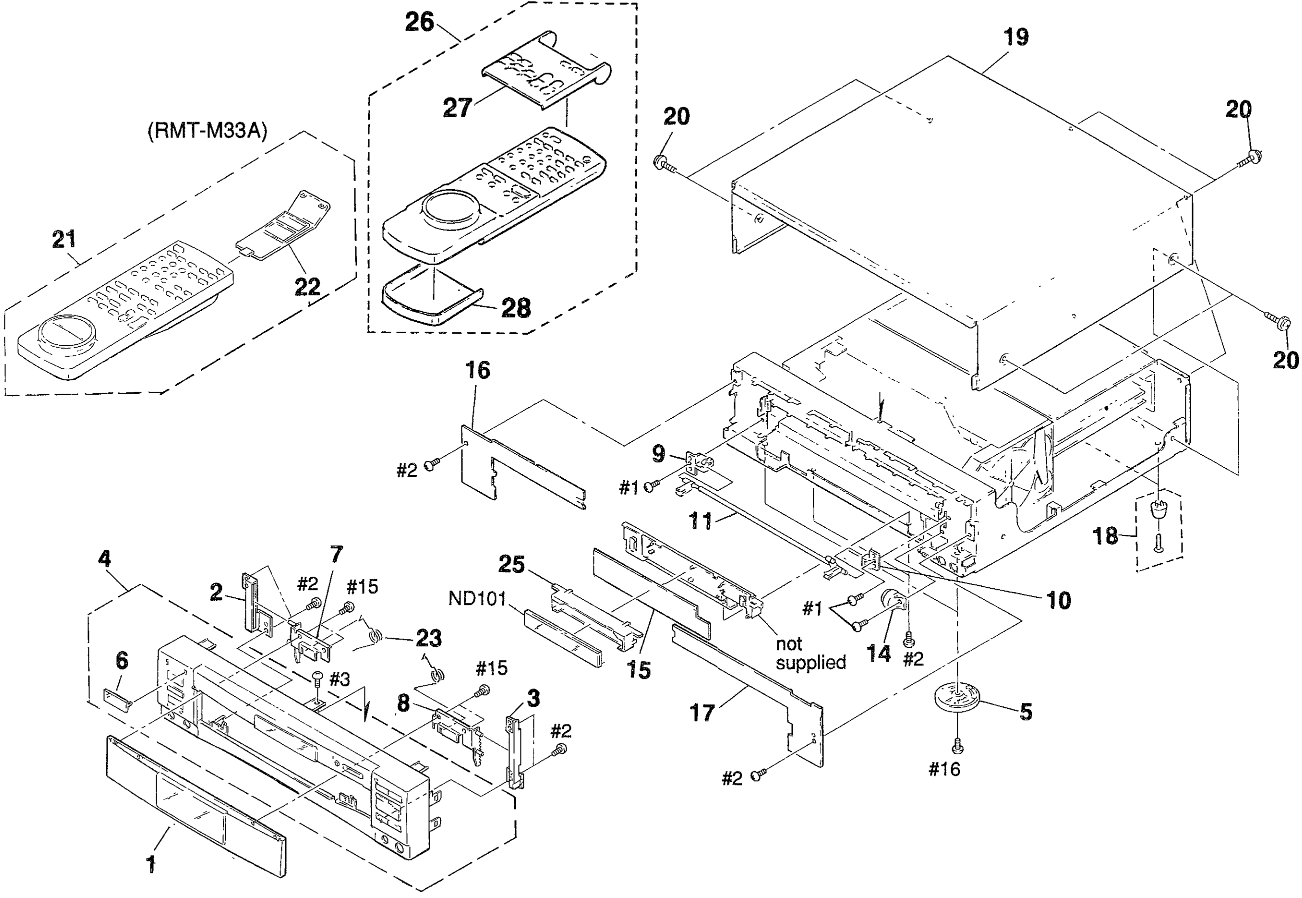
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) ... (RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

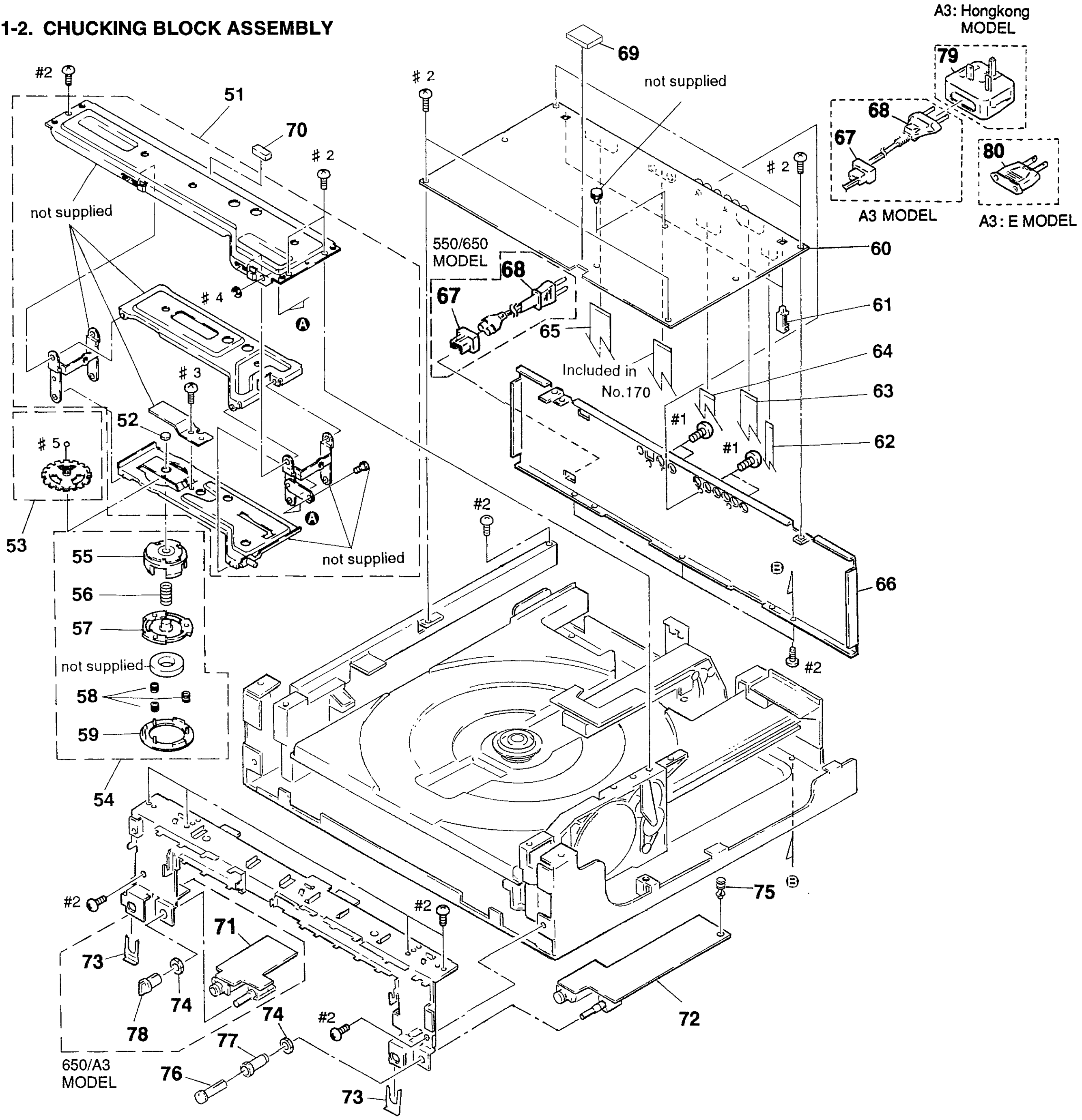
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

5-1-1. CASE AND FRONT PANEL ASSEMBLY



Ref. No.	Part No.	Description	Remarks
1	X-3944-656-1	DOOR ASSY (550)	
1	X-3944-663-1	DOOR ASSY (650)	
1	X-3944-666-1	DOOR ASSY (A3)	
2	3-961-801-01	HOLDER (L), SLIDE	
3	3-961-802-01	HOLDER (R), SLIDE	
4	X-3944-655-1	PANEL ASSY, FRONT (550)	
4	X-3944-662-1	PANEL ASSY, FRONT (650)	
4	X-3944-665-1	PANEL ASSY, FRONT (A3)	
5	X-3942-810-1	FOOT ASSY	
6	3-942-768-02	EMBLEM (NO.5), SONY	
7	3-961-818-01	DISK (L), DOOR	
8	3-961-819-01	DISK (R), DOOR	
9	3-961-800-01	GUIDE, LINK	
10	3-963-178-01	HOLDER, LINK	
11	X-3944-955-1	LINK ASSY	
14	4-919-393-01	DAMPER	
* 15	A-6423-292-A	FP-746 BOARD, COMPLETE (550)	
* 15	A-6423-295-A	FP-746 BOARD, COMPLETE (650)	
* 15	A-6423-302-A	FP-746 BOARD, COMPLETE (A3)	
* 16	A-6423-300-A	PW-721 BOARD, COMPLETE (A3)	
* 16	A-6423-307-A	PW-721 BOARD, COMPLETE (550/650)	
* 17	A-6423-296-A	FP-747 BOARD, COMPLETE (650/A3)	
* 17	A-6423-306-A	FP-747 BOARD, COMPLETE (550)	
18	3-961-156-11	FOOT	
* 19	3-961-785-11	CASE, UPPER (550/650)	
* 19	3-961-785-21	CASE, UPPER (A3)	
20	3-710-901-41	SCREW, TAPPING	
21	1-467-380-31	REMOTE COMMANDER (RMT-M33A)(550)	
22	3-943-535-01	COVER, BATTERY (RMT-M33A) (550)	
23	3-961-822-01	SPRING, DOOR	
* 25	3-961-813-01	HOLDER, FL	
26	1-473-008-31	REMOTE COMMANDER (RMT-M37A)(650)	
26	1-473-008-41	REMOTE COMMANDER (RMT-M37B)(A3)	
27	3-709-008-01	COVER ASSY M37A	
27	3-709-009-01	COVER ASSY M37B	
28	3-708-977-01	COVER, BATTERY	
ND101	1-517-396-11	TUBE, FLUORESCENT INDICATOR	

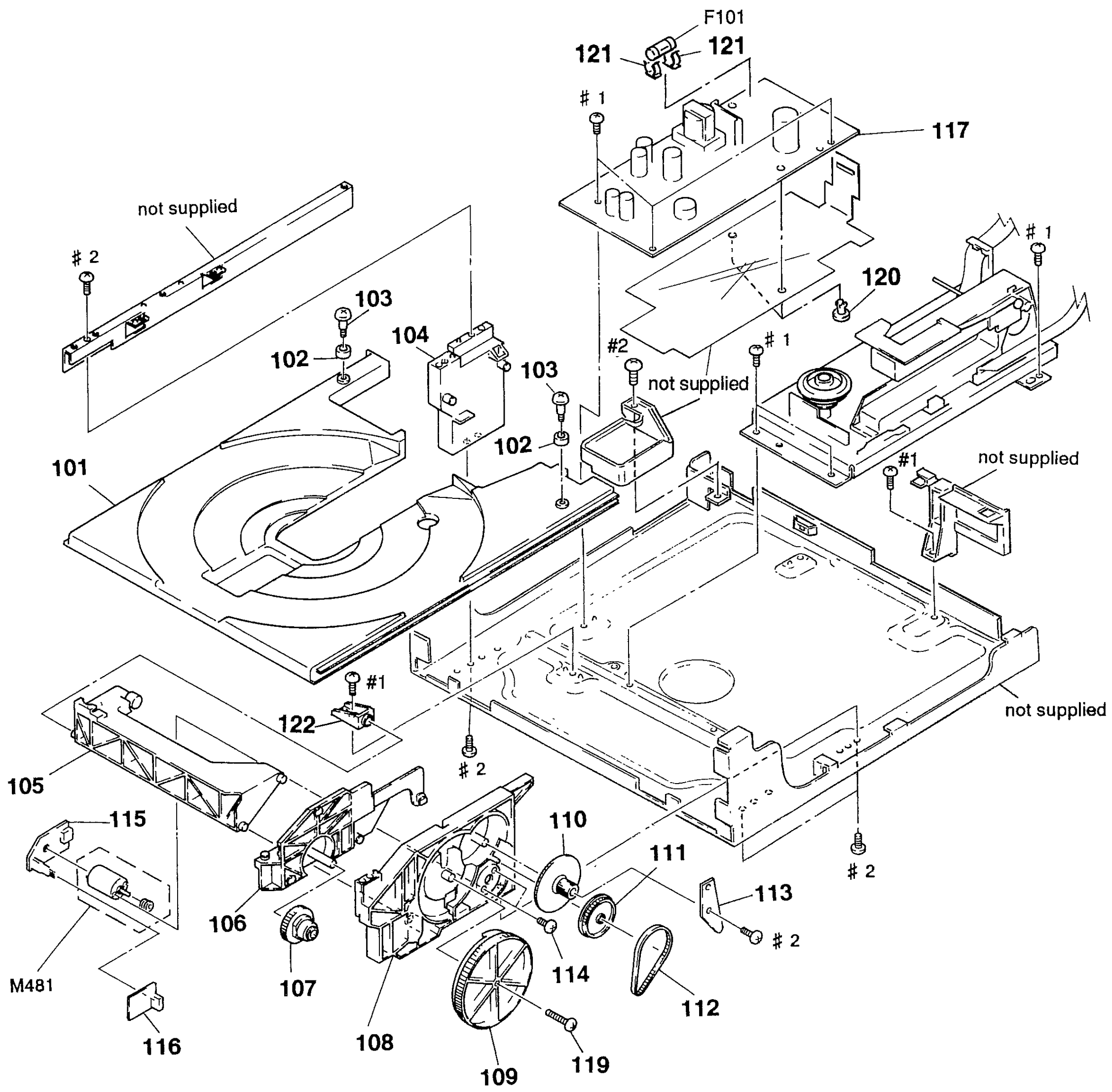
5-1-2. CHUCKING BLOCK ASSEMBLY


A3: Hongkong MODEL
79
68
67
80
A3 MODEL
A3 : E MODEL
69
not supplied
#2
51
70
not supplied
#4
A
#3
52
#5
53
55
56
57
not supplied
58
59
54
not supplied
550/650 MODEL
68
67
65
Included in No.170
60
61
64
63
62
#1
66
B
#2
71
73
74
78
77
76
650/A3 MODEL
72
75

Ref. No.	Part No.	Description	Remarks
51	A-6415-896-A	CHUCKING SUB BLOCK ASSY	
52	3-953-392-01	RETAINER, THRUST	
53	X-3942-787-1	PLATE ASSY, TOP	
54	A-6415-644-G	CHUCK BLOCK ASSY	
55	3-953-288-01	PLATE, CHUCKING	
56	3-953-291-01	SPRING (1), COMPRESSION	
57	X-3942-776-1	HOLDER ASSY, MAGNET	
58	3-953-290-01	SPRING (2), COMPRESSION	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER	
* 60	A-6423-291-A	MB-717 BOARD, COMPLETE (550)	
* 60	A-6423-294-A	MB-717 BOARD, COMPLETE (650)	
* 60	A-6423-301-A	MB-717 BOARD, COMPLETE (A3)	
* 61	3-962-283-01	GUIDE, MB	
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR	
63	1-769-651-11	CABLE, FLAT (FFC) 13 ARBOR	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR	
* 66	3-961-786-11	PANEL, REAR (550)	
* 66	3-961-786-21	PANEL, REAR (650)	
* 66	3-961-786-31	PANEL, REAR (A3)	
⚠67	1-526-985-11	INLET 2P (550/650)	
⚠67	3-703-244-00	BUSHING (2104), CORD (A3)	
⚠68	1-574-085-11	CORD, POWER (550/650)	
⚠68	1-575-912-21	CORD, POWER (A3)	
69	3-728-465-01	CUSHION, OPT	
70	9-911-840-XX	CUSHION (U)	
* 71	A-6423-297-A	HP-718 BOARD, COMPLETE (650/A3)	
* 72	A-6423-293-A	MA-712 BOARD, COMPLETE	
* 73	3-684-436-01	PLATE, MOUNT	
74	3-950-989-01	NUT (M7), HEXAGON	
75	3-531-576-11	RIVET	
76	3-953-318-11	KNOB, MICROPHONE (550/650)	
76	3-953-318-21	KNOB, MICROPHONE (A3)	
77	3-953-319-11	KNOB, ECHO (550/650)	
77	3-953-319-21	KNOB, ECHO (A3)	
78	3-962-745-01	KNOB (A2.TYPE), VOL (650)	
78	3-962-745-11	KNOB (A2.TYPE), VOL (A3)	
79	1-770-019-11	ADAPTOR, CONVERSION (A3:Hongkong)	
80	1-569-008-11	ADAPTOR, CONVERSION 2P (A3:E)	

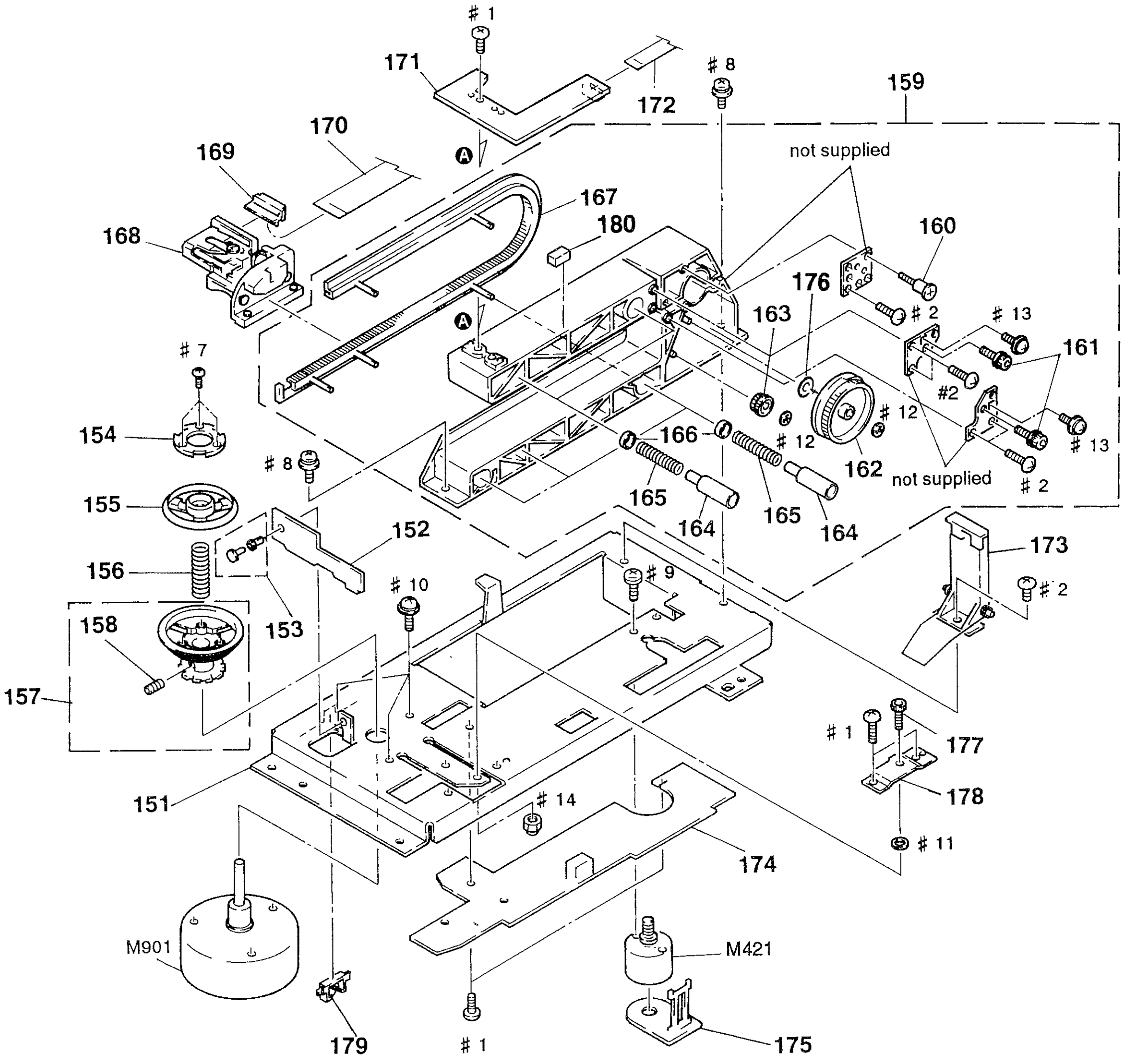
Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

5-1-3. MAIN SHASSIS ASSEMBLY


F101
121
121
# 1
117
not supplied
# 2
103
104
102
120
# 1
#2
# 1
not supplied
103
102
101
#1
not supplied
#1
122
# 2
not supplied
105
115
110
111
# 2
113
# 2
106
107
114
112
M481
116
108
109
119

Ref. No.	Part No.	Description	Remarks
101	A-6415-895-A	TRAY (91U) ASSY	
* 102	4-914-248-01	STOPPER, RUBBER	
103	3-963-090-01	SCREW, TRAY STOPPER	
* 104	X-3944-730-1	STAY (L) ASSY, F	
* 105	X-3944-729-1	FRAME ASSY, TRAY UD	
106	X-3944-514-1	BASE ASSY, L SUB	
107	3-961-085-01	GEAR, IDLER	
108	X-3944-513-1	BASE ASSY, LOADING	
109	3-961-083-01	GEAR, CONTROL	
110	3-961-081-01	GEAR, MIDDLE	
111	3-961-084-01	PULLEY (A)	
112	3-961-082-01	BELT, TIMING	
* 113	3-962-050-01	STAY, REINFORCEMENT	
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-21	POWER BLOCK (A3)	
117	1-468-020-11	POWER BLOCK (550/650)	
119	3-962-812-01	SCREW (+BV 3X18)	
120	3-531-576-11	RIVET	
121	1-533-233-11	HOLDER, FUSE	
* 122	3-961-101-11	HOLDER, UD FRAME	
F101	1-532-286-11	FUSE TIME LUG (3.15A 250V) (A3)	
F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (550/650)	
M481	1-541-309-11	MOTOR, LOADING (RF-370C)	

5-1-4. MECHANISM DECK ASSEMBLY



# 1
171
172
# 8
159
170
169
not supplied
168
Ⓐ
167
180
160
176
163
# 2
# 13
161
#2
# 7
# 12
154
166
# 12
# 8
162
not supplied
# 2
# 13
165
155
165
164
164
152
173
# 10
# 9
# 2
156
158
153
157
# 1
177
151
# 14
178
# 11
174
M901
M421
179
# 1
175

Ref. No.	Part No.	Description	Remarks
* 151	3-961-112-01	PLATE, BASE	
* 152	A-6423-231-A	FG-707 BOARD, COMPLETE	
* 153	3-954-681-01	RIVET, NYLON	
154	3-953-293-01	PLATE (C), YOKE	
155	3-953-292-01	GUIDE, CENTER	
156	3-953-289-01	SPRING (3), COMPRESSION	
157	X-3942-779-1	TURNTABLE ASSY	
158	3-701-507-00	SET SCREW, DOUBLE POINT, (M3X5)	
* 159	A-6404-121-A	BASE BLOCK ASSY, FEED	
160	3-961-208-01	SCREW, FLEXIBLE DISPOSITION	
161	3-899-249-01	BOLT, HEXAGON SOCKET	
162	3-953-254-01	CAM, TILT DRIVING	
163	3-953-259-01	GEAR, TILT MIDWAY	
164	3-953-255-03	HOLDER, U	
165	3-953-267-01	SPRING, COMPRESSION	
166	3-953-830-01	WASHER, U	
167	3-961-126-01	GUIDE (900), U	
⚠168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
169	3-953-268-01	HOLDER (18P), FLEXIBLE	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
* 171	A-6423-232-A	BI-703 BOARD, COMPLETE	
172	1-769-680-11	FLAT CABLE (FCC) (4 CORE)	
* 173	A-6404-111-A	STAND ASSY, FLEXIBLE RETAINER	
* 174	A-6423-230-A	MD-705 BOARD, COMPLETE	
* 175	A-6423-229-A	MT-706 BOARD, COMPLETE	
176	3-701-439-21	WASHER	
177	3-953-829-01	BOLT	
* 178	3-953-258-11	PLATE, ADJUSTMENT, AT	
* 179	3-961-199-01	SADDLE, EDGE	
180	9-911-841-XX	CUSHION, RUBBER	
M421	X-3944-693-1	MOTOR ASSY, TILT	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

5-2. ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be defferent from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μ PB... , uPC... , μPC... ,
  uPD..., μPD...
- CAPACITORS:
  uF: μF
- COILS
  uH: μH

Ref. No.	Part No.	Description	Remarks
*	A-6423-232-A	BI-703 BOARD, COMPLETE	
		**********************	
		(Ref.No.2,000 Series)	
	3-953-261-01	HOLDER, PD	
		< CAPACITOR >	
C411	1-163-075-00	CERAMIC CHIP 0.047uF	50V
		< CONNECTOR >	
CN411	1-691-063-21	HOUSING, CONNECTOR 4P	
		< PHOTO INTERUPTER >	
PH411	8-729-020-74	DIODE GP1S24	
		< TRANSISTOR >	
Q411	8-729-904-10	TRANSISTOR PT360FS	
Q412	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q413	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q414	8-729-904-10	TRANSISTOR PT360FS	
		< RESISTOR >	
R411	1-216-045-00	METAL CHIP 680 5% 1/10W	
R412	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R413	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R414	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R415	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R416	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R417	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R418	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
**			
*	A-6423-231-A	FG-707 BOARD, COMPLETE	
		**********************	
		(Ref.No.2,000 Series)	
		< CAPACITOR >	
C401	1-163-035-00	CERAMIC CHIP 0.047uF	50V

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN401	1-691-863-11	CONNECTOR, BOARD TO BOARD	
		< JUMPER RESISTOR >	
JR403	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< PHOTO INTERUPTER >	
PH401	8-729-020-74	DIODE GP1S24	
		< TRANSISTOR >	
Q401	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
		< RESISTOR >	
R401	1-216-198-91	METAL GLAZE 1K 5% 1/8W	
R402	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R403	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R404	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R405	1-216-039-00	METAL CHIP 390 5% 1/10W	
**			
*	A-6423-302-A	FP-746 BOARD, COMPLETE (A3)	
		***************************	
*	A-6423-292-A	FP-746 BOARD, COMPLETE (550)	
		****************************	
*	A-6423-295-A	FP-746 BOARD, COMPLETE (650)	
		****************************	
		(Ref.No.3,000 Series)	
*	3-961-813-01	HOLDER, FL	
		< CAPACITOR >	
C101	1-124-589-11	ELECT 47uF 20%	16V
C102	1-124-589-11	ELECT 47uF 20%	16V
C103	1-163-117-00	CERAMIC CHIP 100PF 5%	50V
C104	1-126-163-11	ELECT 4.7uF 20%	50V
C105	1-124-248-00	ELECT 22uF 20%	35V

Ref. No.	Part No.	Description			Remarks
C106	1-126-096-11	ELECT	10uF	20%	35V
C107	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C108	1-124-589-11	ELECT	47uF	20%	16V
C109	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C110	1-124-589-11	ELECT	47uF	20%	16V
C111	1-163-031-11	CERAMIC CHIP	0.01uF		50V
⚠C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
⚠C113	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C114	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C115	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C116	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C117	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C118	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C120	1-164-232-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN101	1-506-484-11	PIN, CONNECTOR 5P (550)			
CN101	1-506-486-11	PIN, CONNECTOR 7P (650/A3)			
CN102	1-506-487-11	PIN, CONNECTOR 8P			
CN103	1-691-647-11	SOCKET, CONNECTOR 13P			
CN105	1-506-485-11	PIN, CONNECTOR 6P			
		< DIODE >			
⚠D101	8-719-210-39	DIODE	EC10QS-04		
D102	8-719-978-93	DIODE	DTZ-TT11-30B		
⚠D103	8-719-210-39	DIODE	EC10QS-04		
D104	8-719-105-73	DIODE	RD4.7M-B2		
⚠D105	8-719-210-39	DIODE	EC10QS-04		
D106	8-719-988-62	DIODE	1SS355		
		< FILTER >			
FL101	1-421-927-21	FILTER, NOISE			
		< IC >			
IC101	8-759-074-40	IC	PST572DMT-T1		
IC102	8-759-336-60	IC	MB89095PF-G-167-BND		
IC103	8-759-276-29	IC	XL9020F-S-E2		
		< COIL >			
L101	1-414-189-31	INDUCTOR 100uH			
L102	1-414-189-31	INDUCTOR 100uH			
		< FLUORECENT INDICATOR >			
ND101	1-517-396-11	TUBE, FLUORESCENT INDICATOR			
		< PHOTO INTERUPTER >			
PH101	8-749-010-69	PHOTO INTERUPTER GP158V			

Ref. No.	Part No.	Description				Remarks
		< TRANSISTOR >				
⚠Q101	8-729-140-97	TRANSISTOR	KSA708			
Q102	8-729-216-22	TRANSISTOR	2SA1162			
Q103	8-729-901-01	TRANSISTOR	DTC144EK			
Q104	8-729-901-06	TRANSISTOR	DTA144EK			
Q105	8-729-901-05	TRANSISTOR	DTA124EK			(650/A3)
Q106	8-729-901-05	TRANSISTOR	DTA124EK			(650/A3)
Q107	8-729-901-05	TRANSISTOR	DTA124EK			
Q108	8-729-901-05	TRANSISTOR	DTA124EK			
Q109	8-729-901-05	TRANSISTOR	DTA124EK			
		< RESISTOR >				
R101	1-216-009-00	METAL CHIP	22	5%	1/10W	
R102	1-216-033-00	METAL CHIP	220	5%	1/10W	
R103	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R105	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R106	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R107	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R108	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R109	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R110	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R111	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R112	1-216-099-00	METAL CHIP	120K	5%	1/10W	
⚠R113	1-208-806-11	METAL CHIP	10K	0.50%	1/10W	
⚠R114	1-208-806-11	METAL CHIP	10K	0.50%	1/10W	
R115	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R116	1-216-073-00	METAL CHIP	10K	5%	1/10W	
⚠R117	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R118	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R119	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R120	1-216-033-00	METAL CHIP	220	5%	1/10W	
R121	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R122	1-216-033-00	METAL CHIP	220	5%	1/10W	
R123	1-216-081-00	METAL CHIP	22K	5%	1/10W	(550)
R123	1-216-073-00	METAL CHIP	10K	5%	1/10W	(650/A3)
R124	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R125	1-216-033-00	METAL CHIP	220	5%	1/10W	
R126	1-216-033-00	METAL CHIP	220	5%	1/10W	
R127	1-216-033-00	METAL CHIP	220	5%	1/10W	
R128	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R129	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R130	1-216-033-00	METAL CHIP	220	5%	1/10W	
R132	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R133	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R144	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R145	1-216-049-91	METAL GLAZE	1K	5%	1/10W	

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
R151	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R152	1-216-073-00	METAL CHIP 10K 5%	1/10W (550)
R152	1-216-081-00	METAL CHIP 22K 5%	1/10W (650/A3)
R153	1-216-073-00	METAL CHIP 10K 5%	1/10W
R154	1-216-073-00	METAL CHIP 10K 5%	1/10W
R155	1-208-806-11	METAL CHIP 10K 0.50%	1/10W

< TRANSFORMER >

⚠T101	1-448-740-21	TRANSFORMER, DC-DC CONVERTER	

< VIBRATOR >

X101	1-579-125-11	VIBRATOR, CERAMIC 8MHz	

****

* A-6423-306-A FP-747 BOARD, COMPLETE (550)

****

* A-6423-296-A FP-747 BOARD, COMPLETE (650/A3)

****

(Ref.No.3,000 Series)

< CONNECTOR >

CN201	1-506-484-11	PIN, CONNECTOR 5P	(550)
CN201	1-506-486-11	PIN, CONNECTOR 7P	(650/A3)

< DIODE >

D201	8-719-302-07	LED SEL1810A (THEATER MODE)	(650/A3)
D202	8-719-955-04	LED PY5504S-1 (LD DIGEST)	(650/A3)
D203	8-719-955-04	LED PY5504S-1 (AUTO RESUME)	
D204	8-719-955-04	LED PY5504S-1 (B)	
D205	8-719-955-04	LED PY5504S-1 (A)	

< RESISTOR >

R201	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R202	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R203	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R204	1-216-079-00	METAL CHIP 18K 5%	1/10W
R205	1-216-089-00	METAL CHIP 47K 5%	1/10W
R206	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R207	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R208	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R209	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R210	1-216-037-00	METAL CHIP 330 5%	1/10W (650/A3)
R211	1-216-031-00	METAL CHIP 180 5%	1/10W (650/A3)
R212	1-216-031-00	METAL CHIP 180 5%	1/10W
R213	1-216-031-00	METAL CHIP 180 5%	1/10W
R214	1-216-031-00	METAL CHIP 180 5%	1/10W

< SWITCH >

Ref. No.	Part No.	Description	Remarks
S201	1-762-365-21	SWITCH, TACTILE (▶▶|)	
S202	1-762-365-21	SWITCH, TACTILE (|◀◀)	
S203	1-762-365-21	SWITCH, TACTILE (▶▶)	
S204	1-762-365-21	SWITCH, TACTILE (◀◀)	
S205	1-762-365-21	SWITCH, TACTILE (THEATER MODE)	(650/A3)
S206	1-762-365-21	SWITCH, TACTILE (B)	
S207	1-762-365-21	SWITCH, TACTILE (A)	
S208	1-762-365-21	SWITCH, TACTILE (❚❚)	
S209	1-762-365-21	SWITCH, TACTILE (▷)	
S210	1-762-365-21	SWITCH, TACTILE (■)	

****

* A-6423-297-A HP-718 BOARD, COMPLETE (650/A3)

****

(Ref.No.3,000 Series)

< CAPACITOR >

C551	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C552	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C553	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	

< CONNECTOR >

CN551	1-506-483-21	PIN, CONNECTOR 4P	

< DIODE >

D551	8-719-988-62	DIODE 1SS355	
D552	8-719-988-62	DIODE 1SS355	

< FERRITE BEAD >

FB551	1-410-989-11	INDUCTOR CHIP 0.47UH	
FB552	1-410-989-11	INDUCTOR CHIP 0.47UH	
FB553	1-410-989-11	INDUCTOR CHIP 0.47UH	

< FILTER >

FL551	1-236-071-11	ENCAPSULATED COMPONENT	

< JACK >

J551	1-568-151-21	JACK, LARGE TYPE (PHONES)	

< TRANSISTOR >

Q551	8-729-023-22	TRANSISTOR 2SD2114KT146	
Q552	8-729-023-22	TRANSISTOR 2SD2114KT146	

< RESISTOR >

R551	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R552	1-216-013-00	METAL CHIP 33 5% 1/10W	
R553	1-216-013-00	METAL CHIP 33 5% 1/10W	
R554	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R555	1-216-073-00	METAL CHIP 10K 5% 1/10W	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
R556	1-216-073-00	METAL CHIP 10K 5% 1/10W	
		< VARIABLE RESISTOR >	
RV551	1-223-894-11	RES,VAR,CARBON 500/500 (LEVEL)	
***			
*	A-6423-293-A	MA-712 BOARD, COMPLETE ********************** (Ref.No.3,000 Series)	
		< CAPACITOR >	
C501	1-126-160-11	ELECT 1uF 20% 50V	
C502	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C503	1-126-160-11	ELECT 1uF 20% 50V	
C504	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C505	1-126-163-11	ELECT 4.7uF 20% 50V	
C506	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
C507	1-164-161-11	CERAMIC CHIP 0.0022uF 10% 100V	
C508	1-126-163-11	ELECT 4.7uF 20% 50V	
C509	1-124-584-00	ELECT 100uF 20% 10V	
C510	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C511	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C512	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C513	1-164-346-11	CERAMIC CHIP 1uF 16V	
C514	1-124-584-00	ELECT 100uF 20% 10V	
C515	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C516	1-163-135-00	CERAMIC CHIP 560PF 5% 50V	
C517	1-163-018-00	CERAMIC CHIP 0.0056uF 5% 50V	
C518	1-164-346-11	CERAMIC CHIP 1uF 16V	
C519	1-163-036-00	CERAMIC CHIP 0.068uF 50V	
C520	1-124-589-11	ELECT 47uF 20% 16V	
C521	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C522	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C523	1-163-036-00	CERAMIC CHIP 0.068uF 50V	
C524	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C525	1-164-695-11	CERAMIC CHIP 0.0022uF 5% 50V	
C526	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C527	1-164-346-11	CERAMIC CHIP 1uF 16V	
C528	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C529	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C530	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C531	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C532	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
C533	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
C534	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
C535	1-124-589-11	ELECT 47uF 20% 16V	
C536	1-124-589-11	ELECT 47uF 20% 16V	
C537	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C538	1-126-157-11	ELECT 10uF 20% 16V	

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN501	1-506-484-11	PIN, CONNECTOR 5P	
		< DIODE >	
D501	8-719-800-76	DIODE 1SS226	
D502	8-719-977-05	DIODE DTZ-TT11-6.2	
D505	8-719-911-19	DIODE 1SS119	
D506	8-719-911-19	DIODE 1SS119	
		< FERRITE BEAD >	
FB501	1-410-991-11	INDUCTOR CHIP 0.68UH	
FB503	1-410-396-41	FERRITE BEAD INDUCTOR 0.45uH	
		< FILTER >	
FL501	1-236-728-11	ENCAPSULATED COMPONENT	
FL502	1-236-728-11	ENCAPSULATED COMPONENT	
		< IC >	
IC501	8-759-265-83	IC M65843FP-T1	
IC502	8-759-099-06	IC M5218AFP-TE1	
IC503	8-759-924-46	IC BA4560F	
IC504	8-759-630-34	IC M5278L05M	
		< JACK >	
J501	1-569-112-31	JACK, LARGE TYPE (MIC)	
		< COIL >	
L501	1-414-189-31	INDUCTOR 100uH	
L502	1-414-167-11	INDUCTOR 1mH	
		< TRANSISTOR >	
Q501	8-729-901-04	TRANSISTOR DTA114EK	
		< RESISTOR >	
R501	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R502	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R503	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R504	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R505	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R506	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R507	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R508	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R509	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R510	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R512	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R513	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R514	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R515	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R516	1-216-077-00	METAL CHIP 15K 5% 1/10W	

Ref. No.	Part No.	Description			Remarks
R517	1-216-073-00	METAL CHIP	10K	5%	1/10W
R518	1-216-077-00	METAL CHIP	15K	5%	1/10W
R519	1-216-081-00	METAL CHIP	22K	5%	1/10W
R520	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R521	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R522	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R523	1-216-097-00	METAL CHIP	100K	5%	1/10W
R524	1-216-012-00	METAL GLAZE	30	5%	1/10W
R525	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R526	1-216-073-00	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV501 1-223-895-11 RES, VAR, CARBON 10K/10K (LEVEL)

****

* A-6423-301-A MB-717 BOARD, COMPLETE (A3)

****

* A-6423-291-A MB-717 BOARD, COMPLETE (550)

****

* A-6423-294-A MB-717 BOARD, COMPLETE (650)

****

(Ref.No.1,000 Series)

? 3-964-859-01 PLATE, GROUND (A3)

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C001	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C002	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C003	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C004	1-124-443-00	ELECT	100uF	20%	10V
C005	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C006	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C007	1-126-177-11	ELECT	100uF	20%	10V
C008	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C009	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C010	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C110	1-163-251-11	CERAMIC CHIP	100PF	5%	50V(650/A3)
C011	1-124-443-00	ELECT	100uF	20%	10V
C012	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C013	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C014	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C015	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C017	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C018	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C019	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C020	1-126-803-11	ELECT	47uF	20%	10V
C021	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C022	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C023	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C024	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C025	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C026	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C027	1-126-916-11	ELECT	1000uF	20%	6.3V
C028	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C029	1-163-116-00	CERAMIC CHIP	91PF	5%	50V
C030	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C032	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C033	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C034	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C035	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C036	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C037	1-163-108-00	CERAMIC CHIP	43PF	5%	50V
C038	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C039	1-163-114-00	CERAMIC CHIP	75PF	5%	50V
C040	1-124-239-00	ELECT	6.9uF	20%	10V
C041	1-124-257-00	ELECT	2.2uF	20%	50V
C042	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C043	1-163-116-00	CERAMIC CHIP	91PF	5%	50V
C044	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C045	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C046	1-124-584-00	ELECT	100uF	20%	10V
C047	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C048	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C049	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C050	1-126-923-11	ELECT	220uF	20%	10V
C051	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C052	1-163-220-11	CERAMIC CHIP	3PF	0.25PF	50V
C053	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C054	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C055	1-124-443-00	ELECT	100uF	20%	10V
C056	1-124-443-00	ELECT	100uF	20%	10V
C057	1-124-907-11	ELECT	10uF	20%	50V
C058	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C059	1-126-803-11	ELECT	47uF	20%	10V
C060	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C061	1-126-803-11	ELECT	47uF	20%	10V
C062	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C063	1-124-443-00	ELECT	100uF	20%	10V
C064	1-126-803-11	ELECT	47uF	20%	10V
C065	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C066	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C067	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C068	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C069	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C071	1-216-295-91	CONDCTOR, CHIP	(2012)		
C072	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C074	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C075	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C076	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C077	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C078	1-124-903-11	ELECT	1uF	20%	50V

MB-717

Ref. No.	Part No.	Description			Remarks
C079	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C080	1-124-443-00	ELECT	100uF	20%	10V
C081	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C082	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C083	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C085	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C088	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C089	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C090	1-126-803-11	ELECT	47uF	20%	10V
C091	1-126-803-11	ELECT	47uF	20%	10V
C092	1-124-589-11	ELECT	47uF	20%	16V (550)
C093	1-163-031-11	CERAMIC CHIP	0.01uF		50V (550)
C094	1-126-803-11	ELECT	47uF	20%	10V
C095	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C096	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C097	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C098	1-124-907-11	ELECT	10uF	20%	50V
C100	1-163-031-11	CERAMIC CHIP	0.01uF		50V (550)
C110	1-163-125-00	CERAMIC CHIP	220PF	5%	50V (550)
C111	1-164-346-11	CERAMIC CHIP	1uF		16V
C112	1-124-907-11	ELECT	10uF	20%	50V
C113	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C114	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C115	1-126-803-11	ELECT	47uF	20%	10V
C116	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V (550)
C118	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C120	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C200	1-124-443-00	ELECT	100uF	20%	10V
C201	1-126-803-11	ELECT	47uF	20%	10V
C202	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C203	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C204	1-126-803-11	ELECT	47uF	20%	10V
C205	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C206	1-124-907-11	ELECT	10uF	20%	50V
C207	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C208	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C209	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C210	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C211	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C212	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C214	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C215	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C216	1-126-803-11	ELECT	47uF	20%	10V
C217	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C218	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C219	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C220	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C221	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C222	1-163-033-91	CERAMIC CHIP	0.022uF		50V

Ref. No.	Part No.	Description			Remarks
C223	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C224	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C225	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C226	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C227	1-126-803-11	ELECT	47uF	20%	10V
C228	1-124-443-00	ELECT	100uF	20%	10V
C229	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C230	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C231	1-137-368-11	FILM	0.0047uF	5%	50V
C232	1-137-378-11	FILM	0.22uF	5%	50V
C233	1-137-368-11	FILM	0.0047uF	5%	50V
C234	1-137-378-11	FILM	0.22uF	5%	50V
C235	1-137-442-11	FILM	0.039uF	5%	50V
C236	1-137-442-11	FILM	0.039uF	5%	50V
C237	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C238	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C239	1-137-399-11	FILM	0.1uF	5%	50V
C240	1-126-803-11	ELECT	47uF	20%	10V
C241	1-124-902-00	ELECT	0.47uF	20%	50V
C242	1-124-907-11	ELECT	10uF	20%	50V
C244	1-126-803-11	ELECT	47uF	20%	10V
C245	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C247	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C249	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C250	1-107-714-11	ELECT	10uF	20%	16V
C251	1-109-889-11	ELECT	1uF	20%	50V
C252	1-126-803-11	ELECT	47uF	20%	10V
C253	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C254	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C257	1-126-916-11	ELECT	1000uF	20%	6.3V
C258	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C259	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C260	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C261	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C262	1-124-927-11	ELECT	4.7uF	20%	100V
C264	1-124-927-11	ELECT	4.7uF	20%	100V
C265	1-124-927-11	ELECT	4.7uF	20%	100V
C267	1-124-927-11	ELECT	4.7uF	20%	100V
C268	1-124-927-11	ELECT	4.7uF	20%	100V
C269	1-124-927-11	ELECT	4.7uF	20%	100V
C270	1-124-477-11	ELECT	47uF	20%	25V
C271	1-124-927-11	ELECT	4.7uF	20%	100V
C272	1-124-477-11	ELECT	47uF	20%	25V
C273	1-124-927-11	ELECT	4.7uF	20%	100V
C274	1-124-477-11	ELECT	47uF	20%	25V(650/A3)
C275	1-163-031-11	CERAMIC CHIP	0.01uF		50V(650/A3)
C276	1-124-477-11	ELECT	47uF	20%	25V(650/A3)
C277	1-124-477-11	ELECT	47uF	20%	25V(650/A3)

Ref. No.	Part No.	Description			Remarks
C278	1-124-477-11	ELECT	47uF	20%	25V(650/A3)
C279	1-163-031-11	CERAMIC CHIP	0.01uF		50V(650/A3)
C280	1-124-477-11	ELECT	47uF	20%	25V(650/A3)
C281	1-124-477-11	ELECT	47uF	20%	25V(650/A3)
C286	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C287	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C288	1-124-477-11	ELECT	47uF	20%	25V
C293	1-126-923-11	ELECT	220uF	20%	10V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C401	1-124-589-11	ELECT	47uF	20%	16V
C402	1-124-589-11	ELECT	47uF	20%	16V
C403	1-124-477-11	ELECT	47uF	20%	25V
C404	1-124-477-11	ELECT	47uF	20%	25V
C405	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C406	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C407	1-126-803-11	ELECT	47uF	20%	10V
C408	1-126-803-11	ELECT	47uF	20%	10V
C410	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C411	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C412	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C413	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C414	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C415	1-107-715-11	ELECT	22uF	20%	16V
C416	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C417	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C418	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C419	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C420	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C421	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C423	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C424	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C425	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C427	1-107-714-11	ELECT	10uF	20%	16V
C428	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C430	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C431	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C432	1-163-022-00	CERAMIC CHIP	0.012uF	10%	50V
C433	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C434	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C435	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C436	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C437	1-124-273-00	ELECT	3.3uF	20%	50V
C439	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C440	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C441	1-107-714-11	ELECT	10uF	20%	16V
C443	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C444	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C445	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C447	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C448	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C449	1-109-889-11	ELECT	1uF	20%	50V
C450	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C451	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C453	1-124-903-11	ELECT	1uF	20%	50V
C454	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C455	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C456	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C457	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C458	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C459	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C501	1-126-803-11	ELECT	47uF	20%	10V
C502	1-107-701-11	ELECT	47uF	20%	16V
C503	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C504	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C505	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C506	1-124-927-11	ELECT	4.7uF	20%	100V
C507	1-124-768-11	ELECT	4.7uF	20%	35V
C508	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C509	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C510	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C512	1-124-477-11	ELECT	47uF	20%	25V
C513	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C514	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C515	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C516	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C517	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C519	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C520	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C530	1-163-257-11	CERAMIC CHIP	180PF	5%	50V (550)
C601	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C602	1-126-803-11	ELECT	47uF	20%	10V
C603	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V(650/A3)
C604	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C605	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C606	1-163-038-91	CERAMIC CHIP	0.1uF		25V(650/A3)
C607	1-163-038-91	CERAMIC CHIP	0.1uF		25V(650/A3)
C608	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C609	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C610	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C611	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V(650/A3)

MB-717

Ref. No.	Part No.	Description	Remarks
C612	1-163-227-11	CERAMIC CHIP 10PF 0.5PF	50V
C613	1-163-243-11	CERAMIC CHIP 47PF 5%	50V
C614	1-163-227-11	CERAMIC CHIP 10PF 0.5PF	50V
C615	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C616	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C618	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V(650/A3)
C619	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C620	1-126-803-11	ELECT 47uF 20%	10V
C622	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C628	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C630	1-126-803-11	ELECT 47uF 20%	10V
C632	1-126-803-11	ELECT 47uF 20%	10V
C633	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C639	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C640	1-126-803-11	ELECT 47uF 20%	10V
C641	1-163-038-91	CERAMIC CHIP 0.1uF	25V(650/A3)
C646	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C647	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C651	1-124-589-11	ELECT 47uF 20%	16V
C652	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C653	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C654	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C655	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C656	1-164-232-11	CERAMIC CHIP 0.01uF	50V(650/A3)
		< CONNECTOR >	
CN001	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P	
CN201	1-506-469-11	PIN, CONNECTOR 4P	(650/A3)
CN401	1-750-687-11	HOUSING, CONNECTOR (PC BOARD)	
* CN402	1-764-594-21	CONNECTOR, FPC 18P	
CN403	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P	
CN501	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P	
CN502	1-695-336-11	PIN, CONNECTOR (PC BOARD) 13P	
* CN702	1-564-004-11	PIN, CONNECTOR 5P	
		< TRIMMER >	
CT001	1-141-318-11	CAP, VAR, TRIMMER	
		< DIODE >	
D001	8-719-987-69	DIODE DAN217	
D002	8-719-988-62	DIODE 1SS355	
D110	8-719-988-62	DIODE 1SS355	
D111	8-719-988-62	DIODE 1SS355	
D112	8-719-988-62	DIODE 1SS355	(550)
D202	8-719-914-43	DIODE DAN202K	
D203	8-719-032-80	DIODE KV1430TL00	
D204	8-719-914-42	DIODE DA204K	
D205	8-719-914-42	DIODE DA204K	
D206	8-719-988-62	DIODE 1SS355	

Ref. No.	Part No.	Description	Remarks
D209	8-719-988-62	DIODE 1SS355	
D401	8-719-988-62	DIODE 1SS355	
D402	8-719-914-42	DIODE DA204K	
D403	8-719-914-43	DIODE DAN202K	
D404	8-719-914-44	DIODE DAP202K	
D405	8-719-976-94	DIODE DTZ4.7A	
D501	8-719-988-62	DIODE 1SS355	
D503	8-719-988-62	DIODE 1SS355	
D504	8-719-977-34	DIODE DTZ12	
D505	8-719-914-44	DIODE DAP202K	
D506	8-719-977-22	DIODE DTZ9.1	
		< FERRITE BEAD >	
FB201	1-414-135-11	INDUCTOR CHIP 0UH	
FB202	1-414-135-11	INDUCTOR CHIP 0UH	
FB501	1-414-135-11	INDUCTOR CHIP 0UH	
FB502	1-414-135-11	INDUCTOR CHIP 0UH	
		< FILTER >	
FL001	1-577-543-11	FILTER, CERAMIC	
FL002	1-577-543-11	FILTER, CERAMIC	
FL201	1-236-744-21	FILTER, EMI	
FL202	1-236-744-21	FILTER, EMI	
FL601	1-236-071-11	ENCAPSULATED COMPONENT	(650/A3)
FL602	1-236-071-11	ENCAPSULATED COMPONENT	(650/A3)
FL603	1-236-071-11	ENCAPSULATED COMPONENT	
FL604	1-236-071-11	ENCAPSULATED COMPONENT	
FL605	1-236-071-11	ENCAPSULATED COMPONENT	(650/A3)
		< IC >	
IC001	8-759-299-92	IC AN2661NK	
IC002	8-759-294-46	IC M35014-053SP	
IC003	8-759-290-65	IC MN8811	
IC004	8-759-295-66	IC BA7653AF-E2	(550)
IC005	8-759-324-99	IC MM1118XFBE	
IC201	8-752-372-94	IC CXD2507AQ	
IC202	8-749-921-12	IC GP1F32T (DIGITAL OUT)	
IC203	8-759-253-26	IC CA0002AM-TP	
IC204	8-759-700-43	IC NJM4558M	
IC205	8-759-327-78	IC TC9404FN-EL	
IC206	8-759-700-43	IC NJM4558M	
IC207	8-759-924-46	IC BA4560F	(650/A3)
IC401	8-759-280-89	IC HA11529F	
⚠IC402	8-759-822-38	IC LA6510	
⚠IC403	8-759-700-43	IC NJM4558M	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
IC404	8-759-700-43	IC NJM4558M	
IC405	8-759-700-43	IC NJM4558M	
IC406	8-759-700-43	IC NJM4558M	
IC407	8-759-300-71	IC HD14053BFP	
IC501	8-759-336-57	IC MB89094PF-G-138-BND	(550)
IC501	8-759-344 51	IC MB89094PF-G-141-BND	(650/A3)
IC502	8-759-329-96	IC MSM10S0110-069GS-V1K	
IC503	8-759-231-92	IC TA7291P	
IC504	8-759-058-50	IC XRA10324AF-E2	
IC505	8-759-009-06	IC MC14052BF	
IC506	8-759-300-71	IC HD14053BFP	
IC601	8-759-334-47	IC MSM10S0050-025GS-K	(650/A3)
IC602	8-759-172-96	IC MSM518221-30JS-R1	(650/A3)
IC603	8-759-334-48	IC CXD8535Q	
IC605	8-759-710-86	IC NJM2233BM	

< JACK >

Ref. No.	Part No.	Description	Remarks
J201	1-750-503-11	CONNECTOR, ROUND TYPE (S VIDEO)	
J202	1-764-592-11	JACK 3P (LINE OUT 2)	
J203	1-764-592-11	JACK 3P (LINE OUT 1)	
* J501	1-764-188-11	JACK (SMALL TYPE) (DIA. 3.5) (CONTROL S)	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remarks
JR005	1-216-295-91	CONDCTOR, CHIP (2012)	
JR006	1-216-295-91	CONDCTOR, CHIP (2012)	
JR007	1-216-295-91	CONDCTOR, CHIP (2012)	
JR402	1-216-295-91	CONDCTOR, CHIP (2012)	
JR403	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR404	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR405	1-216-295-91	CONDCTOR, CHIP (2012)	

< COIL >

Ref. No.	Part No.	Description	Remarks
L001	1-408-970-21	INDUCTOR 10uH	
L002	1-408-970-21	INDUCTOR 10uH	
L003	1-408-970-21	INDUCTOR 10uH	
L004	1-408-970-21	INDUCTOR 10uH	
L005	1-408-973-21	INDUCTOR 18uH	
L006	1-410-381-11	INDUCTOR CHIP 10uH	
L007	1-408-974-21	INDUCTOR 22uH	
L008	1-410-512-61	INDUCTOR 18uH	
L009	1-410-512-61	INDUCTOR 18uH	
L010	1-410-507-11	INDUCTOR 6.8uH	
L011	1-410-507-11	INDUCTOR 6.8uH	
L012	1-408-974-21	INDUCTOR 22uH	
L013	1-408-976-21	INDUCTOR 33uH	
L014	1-408-976-21	INDUCTOR 33uH	
L015	1-408-975-21	INDUCTOR 27uH	
L016	1-408-970-21	INDUCTOR 10uH	
L017	1-408-975-21	INDUCTOR 27uH	
L018	1-408-970-21	INDUCTOR 10uH	
L019	1-408-970-21	INDUCTOR 10uH	
L020	1-408-970-21	INDUCTOR 10uH	
L021	1-408-970-21	INDUCTOR 10uH	
L022	1-408-974-21	INDUCTOR 22uH	
L024	1-408-974-21	INDUCTOR 22uH	
L025	1-408-970-21	INDUCTOR 10uH	
L027	1-408-970-21	INDUCTOR 10uH	
L028	1-408-970-21	INDUCTOR 10uH	
L201	1-408-982-21	INDUCTOR 100uH	
L202	1-408-979-21	INDUCTOR 56uH	
L203	1-408-978-21	INDUCTOR 47uH	
L204	1-408-973-21	INDUCTOR 18uH	
L205	1-408-985-21	INDUCTOR 180uH	
L209	1-414-161-21	INDUCTOR 1mH	
L210	1-414-161-21	INDUCTOR 1mH	
L401	1-408-970-21	INDUCTOR 10uH	
L402	1-408-970-21	INDUCTOR 10uH	
L404	1-408-983-21	INDUCTOR 120uH	
L405	1-408-983-21	INDUCTOR 120uH	
L406	1-408-970-21	INDUCTOR 10uH	
L407	1-408-970-21	INDUCTOR 10uH	
L501	1-408-970-21	INDUCTOR 10uH	
L504	1-408-970-21	INDUCTOR 10uH	(550)
L601	1-408-970-21	INDUCTOR 10uH	
L602	1-408-976-21	INDUCTOR 33uH	
L603	1-408-978-21	INDUCTOR 47uH	
L606	1-408-970-21	INDUCTOR 10uH	
L607	1-408-970-21	INDUCTOR 10uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remarks
Q001	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q002	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q003	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q004	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q007	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q009	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q011	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q012	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q013	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q014	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q015	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q016	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q017	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q019	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q020	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

MB-717

Ref. No.	Part No.	Description	Remarks
Q021	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q022	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q023	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q024	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q025	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q026	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q027	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q028	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q030	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q201	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q202	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q203	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q205	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q206	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q207	8-729-027-44	TRANSISTOR DTC114TKA-T146	
Q208	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q209	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q210	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q211	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q212	8-729-202-38	TRANSISTOR 2SC3326N-A	(650/A3)
Q213	8-729-202-38	TRANSISTOR 2SC3326N-A	(650/A3)
Q214	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q215	8-729-202-38	TRANSISTOR 2SC3326N-A	
⚠Q401	8-729-019-01	TRANSISTOR 2SD2394-EF	
⚠Q402	8-729-024-95	TRANSISTOR 2SB1565EF	
⚠Q403	8-729-019-01	TRANSISTOR 2SD2394-EF	
⚠Q404	8-729-024-95	TRANSISTOR 2SB1565EF	
Q405	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q406	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q407	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q408	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q409	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q410	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q411	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q412	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q413	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q414	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q415	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q416	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q417	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q418	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q501	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q502	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q601	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q602	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q604	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q605	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q606	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q607	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

Ref. No.	Part No.	Description	Remarks
Q608	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q609	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q610	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q611	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q612	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q613	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q614	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q615	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q616	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
		< RESISTOR >	
R001	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R002	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R003	1-216-041-00	METAL CHIP 470 5% 1/10W	
R004	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R005	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R006	1-216-021-00	METAL CHIP 68 5% 1/10W	
R007	1-216-035-00	METAL CHIP 270 5% 1/10W	
R008	1-216-047-00	METAL CHIP 820 5% 1/10W	
R009	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R010	1-216-037-00	METAL CHIP 330 5% 1/10W	
R011	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R012	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R013	1-216-295-91	CONDCTOR, CHIP (2012)	(650/A3)
R014	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R015	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R016	1-216-049-91	METAL GLAZE 1K 5% 1/10W	(550)
R017	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R018	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R019	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R020	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R021	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R022	1-216-041-00	METAL CHIP 470 5% 1/10W	
R023	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R024	1-216-295-91	CONDCTOR, CHIP (2012)	
R025	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R027	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R032	1-216-101-00	METAL CHIP 150K 5% 1/10W	(550)
R032	1-216-105-91	METAL GLAZE 220K 5% 1/10W	(650/A3)
R033	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R034	1-216-045-00	METAL CHIP 680 5% 1/10W	
R035	1-216-039-00	METAL CHIP 390 5% 1/10W	
R036	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R038	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R039	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R040	1-216-043-91	METAL GLAZE 560 5% 1/10W	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
R041	1-412-959-11	INDUCTOR 47uH	
R042	1-216-029-00	METAL CHIP 150 5% 1/10W	
R043	1-216-041-00	METAL CHIP 470 5% 1/10W	
R044	1-216-041-00	METAL CHIP 470 5% 1/10W	
R045	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R046	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R047	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R048	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R049	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R050	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R051	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R052	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R053	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R054	1-216-041-00	METAL CHIP 470 5% 1/10W	
R055	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R056	1-216-039-00	METAL CHIP 390 5% 1/10W	
R059	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R061	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R062	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R063	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R064	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R065	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R066	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R067	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R068	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R069	1-216-037-00	METAL CHIP 330 5% 1/10W	
R070	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R071	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R072	1-216-033-00	METAL CHIP 220 5% 1/10W	
R073	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R074	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R075	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R077	1-216-041-00	METAL CHIP 470 5% 1/10W	
R078	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R079	1-216-041-00	METAL CHIP 470 5% 1/10W	
R080	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R081	1-216-021-00	METAL CHIP 68 5% 1/10W	
R082	1-216-041-00	METAL CHIP 470 5% 1/10W	
R083	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R084	1-216-041-00	METAL CHIP 470 5% 1/10W	
R085	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R086	1-216-021-00	METAL CHIP 68 5% 1/10W	
R087	1-216-295-91	CONDCTOR, CHIP (2012)	
R089	1-216-033-00	METAL CHIP 220 5% 1/10W	
R090	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R091	1-216-058-00	METAL GLAZE 2.4K 5% 1/10W	
R093	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R094	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R095	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R097	1-216-295-91	CONDCTOR, CHIP (2012)	
R098	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R099	1-216-037-00	METAL CHIP 330 5% 1/10W	
R100	1-216-295-91	CONDCTOR, CHIP (2012)	
R101	1-216-295-91	CONDCTOR, CHIP (2012)	
R102	1-216-295-91	CONDCTOR, CHIP (2012)	
R103	1-216-295-91	CONDCTOR, CHIP (2012)	
R104	1-216-295-91	CONDCTOR, CHIP (2012)	
R105	1-216-295-91	CONDCTOR, CHIP (2012)	
R106	1-216-295-91	CONDCTOR, CHIP (2012)	
R107	1-216-295-91	CONDCTOR, CHIP (2012)	
R110	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R111	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R112	1-216-295-91	CONDCTOR, CHIP (2012)	
R113	1-216-037-00	METAL CHIP 330 5% 1/10W	
R118	1-216-295-91	CONDCTOR, CHIP (2012)	
R119	1-216-047-00	METAL CHIP 820 5% 1/10W	
R120	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R121	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R122	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R123	1-216-105-91	METAL GLAZE 220K 5% 1/10W	(550)
R123	1-216-111-00	METAL CHIP 390K 5% 1/10W	(650/A3)
R124	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R125	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R126	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R127	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R128	1-216-029-00	METAL CHIP 150 5% 1/10W	(550)
R129	1-216-033-00	METAL CHIP 220 5% 1/10W	
R130	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R139	1-216-295-91	CONDCTOR, CHIP (2012)	
R140	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R141	1-216-295-91	CONDCTOR, CHIP (2012)	
R142	1-216-295-91	CONDCTOR, CHIP (2012)	
R144	1-216-033-00	METAL CHIP 220 5% 1/10W	
R145	1-216-295-91	CONDCTOR, CHIP (2012)	
R201	1-216-295-91	CONDCTOR, CHIP (2012)	
R203	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R206	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R208	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R209	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R210	1-216-041-00	METAL CHIP 470 5% 1/10W	
R211	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R212	1-216-017-00	METAL CHIP 47 5% 1/10W	
R213	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R214	1-216-023-00	METAL CHIP 82 5% 1/10W	
R215	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R216	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R217	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R218	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R219	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R220	1-216-049-91	METAL GLAZE 1K 5% 1/10W	

MB-717

Ref. No.	Part No.	Description	Remarks
R222	1-216-295-91	CONDCTOR, CHIP (2012)	
R223	1-216-295-91	CONDCTOR, CHIP (2012)	
R224	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R226	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R227	1-216-074-00	METAL CHIP 11K 5% 1/10W	
R228	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R229	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
R230	1-216-295-91	CONDCTOR, CHIP (2012)	
R231	1-216-295-91	CONDCTOR, CHIP (2012)	
R232	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R233	1-216-295-91	CONDCTOR, CHIP (2012)	
R235	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R236	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R237	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R238	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R239	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R240	1-216-096-00	METAL GLAZE 91K 5% 1/10W	
R242	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R243	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R245	1-216-104-00	METAL CHIP 200K 5% 1/10W	
R246	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R247	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R248	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R250	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R251	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R252	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R254	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R255	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R256	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R257	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R258	1-216-104-00	METAL CHIP 200K 5% 1/10W	
R260	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R261	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R262	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R263	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R264	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R265	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R266	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R267	1-216-295-91	CONDCTOR, CHIP (2012)	
R269	1-216-295-91	CONDCTOR, CHIP (2012)	
R270	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R271	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R272	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R273	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R276	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R277	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R278	1-216-295-91	CONDCTOR, CHIP (2012)	
R279	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R280	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R281	1-216-049-91	METAL GLAZE 1K 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
R282	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R283	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R284	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R285	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R286	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R287	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R289	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R290	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R291	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R292	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R293	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R294	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R295	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R296	1-216-035-00	METAL CHIP 270 5% 1/10W	
R297	1-216-035-00	METAL CHIP 270 5% 1/10W	
R298	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R299	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R300	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R301	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R302	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R303	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R304	1-216-089-00	METAL CHIP 47K 5% 1/10W	(650/A3)
R305	1-216-089-00	METAL CHIP 47K 5% 1/10W	(650/A3)
R307	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R308	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R309	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R311	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R312	1-216-073-00	METAL CHIP 10K 5% 1/10W	(650/A3)
R313	1-216-073-00	METAL CHIP 10K 5% 1/10W	(650/A3)
R314	1-216-295-91	CONDCTOR, CHIP (2012)	(650/A3)
R315	1-216-295-91	CONDCTOR, CHIP (2012)	(650/A3)
R322	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R323	1-216-033-00	METAL CHIP 220 5% 1/10W	
R324	1-216-033-00	METAL CHIP 220 5% 1/10W	
R352	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R353	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R401	1-216-369-00	METAL OXIDE 1 5% 2W	F
R402	1-216-146-00	METAL GLAZE 6.8 5% 1/8W	
R403	1-216-146-00	METAL GLAZE 6.8 5% 1/8W	
R404	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R405	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R406	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R407	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R408	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R409	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R411	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R412	1-216-045-00	METAL CHIP 680 5% 1/10W	
R413	1-216-047-00	METAL CHIP 820 5% 1/10W	
R414	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R415	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
R416	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R417	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R418	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R419	1-216-045-00	METAL CHIP 680 5% 1/10W	
R420	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R421	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R422	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R423	1-216-039-00	METAL CHIP 390 5% 1/10W	
R424	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R425	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R426	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R427	1-216-017-00	METAL CHIP 47 5% 1/10W	
R428	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R429	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R430	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R431	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R432	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R433	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R434	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R435	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R436	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R437	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R438	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R442	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R444	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R445	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R446	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R447	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R448	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R449	1-216-035-00	METAL CHIP 270 5% 1/10W	
R450	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R451	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R452	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R453	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R454	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R455	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R456	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R457	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R458	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R459	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R460	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R461	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R462	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R463	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R464	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R465	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R466	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R467	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R468	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R469	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R470	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R471	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R472	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R473	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R474	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R475	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R476	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R477	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R478	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R479	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R480	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R481	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R482	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R483	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R484	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R485	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R486	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R487	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R488	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R489	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R490	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R491	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R492	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R493	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R494	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R495	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R496	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R497	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R498	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R499	1-216-090-00	METAL CHIP 51K 5% 1/10W	
R502	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R506	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R507	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R508	1-208-816-11	METAL GLAZE 27K 0.50% 1/10W	
R509	1-208-818-11	METAL GLAZE 33K 0.50% 1/10W	
R510	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R511	1-216-111-00	METAL CHIP 390K 5% 1/10W	
R512	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R513	1-208-838-11	METAL GLAZE 220K 0.50% 1/10W	
R514	1-208-830-11	METAL GLAZE 100K 0.50% 1/10W	
R515	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R516	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R517	1-208-808-11	METAL GLAZE 12K 0.50% 1/10W	
R518	1-208-806-11	METAL GLAZE 10K 0.50% 1/10W	
R519	1-208-818-11	METAL GLAZE 33K 0.50% 1/10W	
R520	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R521	1-208-844-11	METAL GLAZE 390K 0.50% 1/10W	
R522	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R523	1-216-035-00	METAL CHIP 270 5% 1/10W	
R524	1-208-810-11	METAL GLAZE 15K 0.50% 1/10W	

MB-717

Ref. No.	Part No.	Description	Remarks
R525	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R526	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R527	1-216-033-00	METAL CHIP 220 5% 1/10W	
R528	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R530	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R531	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R532	1-216-045-00	METAL CHIP 680 5% 1/10W	
R533	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R534	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R535	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R536	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R537	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R538	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R539	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R540	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R541	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R542	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R543	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
⚠R544	1-212-950-00	FUSIBLE 4.7 5% 1/2W	F
R545	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R546	1-216-045-00	METAL CHIP 680 5% 1/10W	
R547	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R548	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R549	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R550	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R551	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R552	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R553	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R554	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R555	1-216-021-00	METAL CHIP 68 5% 1/10W	
R556	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R557	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R558	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R559	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R560	1-216-033-00	METAL CHIP 220 5% 1/10W	
R561	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R562	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R563	1-216-033-00	METAL CHIP 220 5% 1/10W	
R564	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R566	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R567	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R568	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R569	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R570	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R571	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R572	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R573	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R574	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R576	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R577	1-216-073-00	METAL CHIP 10K 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
R578	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R594	1-216-295-91	CONDCTOR, CHIP (2012)	
R595	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	(550)
R596	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	(550)
R597	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	(550)
R601	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R602	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R603	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R604	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R605	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R606	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R607	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R608	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R609	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R610	1-216-113-00	METAL CHIP 470K 5% 1/10W	(650/A3)
R611	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R612	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R613	1-216-295-91	CONDCTOR, CHIP (2012)	(650/A3)
R614	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R615	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R617	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R618	1-216-113-00	METAL CHIP 470K 5% 1/10W	(650/A3)
R619	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R620	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R621	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R622	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R623	1-216-038-00	METAL CHIP 360 5% 1/10W	
R624	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	(650/A3)
R625	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R627	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R628	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R630	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R633	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R634	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R635	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R636	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R637	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R638	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R639	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R640	1-216-295-91	CONDCTOR, CHIP (2012)	(550)
R641	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R642	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R643	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R644	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R645	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
R646	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R647	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R648	1-216-045-00	METAL CHIP 680 5% 1/10W	(650/A3)
R656	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R657	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R658	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R659	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R660	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R661	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R662	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R663	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R664	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R665	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R666	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R667	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R668	1-216-170-00	METAL GLAZE 68 5% 1/8W	
R669	1-216-170-00	METAL GLAZE 68 5% 1/8W	
R670	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R671	1-216-170-00	METAL GLAZE 68 5% 1/8W	
R672	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R673	1-216-041-00	METAL CHIP 470 5% 1/10W	
R674	1-216-041-00	METAL CHIP 470 5% 1/10W	
R675	1-216-041-00	METAL CHIP 470 5% 1/10W	
R676	1-216-041-00	METAL CHIP 470 5% 1/10W	
R677	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R678	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R679	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R680	1-216-170-00	METAL GLAZE 68 5% 1/8W	
R681	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R682	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R683	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R684	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R685	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	(650/A3)
R687	1-216-295-91	CONDCTOR, CHIP (2012)	
R688	1-216-295-91	CONDCTOR, CHIP (2012)	
R900	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R901	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R902	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R903	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R904	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R905	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R906	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R907	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R908	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R910	1-216-295-91	CONDCTOR, CHIP (2012)	
R911	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R912	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R913	1-216-103-91	METAL GLAZE 180K 5% 1/10W	
R914	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R915	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
R916	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R917	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R918	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R919	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R920	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R921	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R922	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R923	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R924	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R925	1-216-017-00	METAL CHIP 47 5% 1/10W	
R926	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R927	1-216-003-11	METAL GLAZE 12 5% 1/10W	
R928	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R929	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R930	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R931	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R932	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R933	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R935	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R936	1-216-031-00	METAL CHIP 180 5% 1/10W	
R937	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R939	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R944	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R945	1-216-049-91	METAL GLAZE 1K 5% 1/10W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remarks
RV001	1-223-236-11	RES, ADJ, CARBON 1K	
RV401	1-223-241-11	RES, ADJ, CARBON 47K	
RV402	1-223-241-11	RES, ADJ, CARBON 47K	

< SWITCH >

Ref. No.	Part No.	Description	Remarks
S201	1-553-725-21	SWITCH, SLIDE (ATT)	

< VIBRATOR >

Ref. No.	Part No.	Description	Remarks
X001	1-760-693-21	VIBRATOR, CRYSTAL 28.12MHz	
X201	1-567-515-11	VIBRATOR, VARIABLE CRYSTAL 16.93MHz	

****

* A-6423-230-A MD-705 BOARD, COMPLETE

****

(Ref.No.2,000 Series)

3-953-262-01 HOLDER, LED

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
CN431	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P	
CN432	1-691-036-21	HOUSING, CONNECTOR 4P	
CN433	1-766-938-11	CONNECTOR, BOARD TO BOARD 5P	
* CN434	1-564-014-51	PIN, CONNECTOR 4P	

MD-705 MT-706 MT-707 POWER BLOCK

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D431	8-719-912-39	LED SLR-932A	
		< JUMPER RESISTOR >	
JR431	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR432	1-216-295-91	CONDCTOR, CHIP (2012)	
JR433	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR434	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR435	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR436	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR437	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR438	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR439	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR440	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR441	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR442	1-216-295-91	CONDCTOR, CHIP (2012)	
		< PHOTO INTERUPTER >	
PH431	8-729-020-74	DIODE GP1S24	
PH432	8-729-020-74	DIODE GP1S24	
		< RESISTOR >	
R431	1-216-039-00	METAL CHIP 390 5% 1/10W	
R432	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R433	1-216-248-00	METAL GLAZE 120K 5% 1/8W	
R436	1-216-295-91	CONDCTOR, CHIP (2012)	
		< SWITCH >	
S431	1-692-440-11	SWITCH, PUSH	

****

Ref. No.	Part No.	Description	Remarks
*	A-6423-229-A	MT-706 BOARD, COMPLETE **********************	
		(Ref.No.2,000 Series)	
		< CONNECTOR >	
CN421	1-766-937-11	CONNECTOR, BOARD TO BOARD 5P	

****

Ref. No.	Part No.	Description	Remarks
		MT-707 BOARD, COMPLETE ***********************	
		(Ref.No.4,000 Series)	
*	1-654-464-11	MT-707 BOARD	
		< CAPACITOR >	
C481	1-163-038-91	CERAMIC CHIP 0.1uF	25V

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
* CN481	1-569-666-11	PIN, CONNECTOR (PC BOARD) 5P	
CN482	1-695-368-31	PIN, CONNECTOR (PC BOARD) 7P	

****

Ref. No.	Part No.	Description	Remarks
	1-413-989-21	SR539 POWER BLOCK (A3) *****************	
	1-468-020-11	SR538 POWER BLOCK (550/650) *****************	
		(Ref.No.5,000 Series)	
⚠	1-533-223-11	HOLDER, FUSE	
		< CAPACITOR >	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C052	1-163-019-11	MULTILAYER CERAMIC 6800PF 50V	
C053	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C056	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C057	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C058	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C059	1-163-017-11	MULTILAYER CERAMIC 4700PF 50V	
C060	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C061	1-163-017-11	MULTILAYER CERAMIC 4700PF 50V	
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF 50V	
C064	1-130-491-51	FILM 0.047uF 50V	
⚠C101	9-902-038-01	METALLIZED 0.22uF 250V	
⚠C102	9-900-521-01	METALLIZED 0.1uF 250V	
⚠C103	9-900-522-01	CERAMIC 2200PF 400V	(A3)
⚠C103	1-161-741-00	CERAMIC 1000PF 400V	(550/650)
⚠C104	9-900-522-01	CERAMIC 2200PF 400V	(A3)
⚠C104	1-161-741-00	CERAMIC 1000PF 400V	(550/650)
⚠C105	9-900-522-01	CERAMIC 2200PF 400V	(A3)
⚠C106	9-900-522-01	CERAMIC 2200PF 400V	(A3)
⚠C107	9-900-522-01	CERAMIC 2200PF 400V	(A3)
⚠C107	1-161-741-00	CERAMIC 1000PF 400V	(550/650)
⚠C108	9-909-672-01	ALUMINUM ELECTIC 150uF 400V	(A3)
⚠C108	9-900-523-01	ALUMINUM ELECTIC 220uF 200V	(550/650)

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description		Remarks
⚠C109	9-909-672-01	ALUMINUM ELECTIC	150uF	400V (A3)
⚠C110	9-909-673-01	CERAMIC	220PF	1kV (A3)
⚠C110	9-933-752-01	CERAMIC	470PF	1kV (550/650)
⚠C111	9-900-525-01	METALLIZED	0.047uF	400V
⚠C112	1-106-363-00	FILM	0.0068uF	50V
⚠C113	1-130-483-91	METAILLIZED	0.01uF	50V (A3)
⚠C113	1-130-491-51	METAILLIZED	0.047uF	50V (550/650)
⚠C114	1-107-355-51	METALLIZED	0.22uF	50V
⚠C115	1-130-470-00	FILM	820PF	50V
⚠C116	1-216-967-51	ALUMINUM ELECTRIC	47uF	50V
⚠C117	9-900-522-01	CERAMIC	2200PF	400V (A3)
⚠C118	9-900-522-01	CERAMIC	2200PF	400V (A3)
⚠C119	9-909-673-01	CERAMIC	220PF	1kV
⚠C201	1-124-525-11	ALUMINUM ELECTRIC	1000uF	25V
⚠C202	1-124-525-11	ALUMINUM ELECTRIC	1000uF	25V
⚠C203	1-124-760-11	ALUMINUM ELECTRIC	2200uF	10V
⚠C204	1-126-926-11	ALUMINUM ELECTRIC	1000uF	10V
⚠C205	1-126-926-11	ALUMINUM ELECTRIC	1000uF	10V
⚠C206	1-126-925-51	ALUMINUM ELECTRIC	470uF	10V
C208	1-126-964-51	ALUMINUM ELECTRIC	10uF	50V
C210	1-126-964-51	ALUMINUM ELECTRIC	10uF	50V
C211	1-126-925-51	ALUMINUM ELECTRIC	470uF	10V
C212	1-126-923-51	ALUMINUM ELECTRIC	220uF	10V
C213	1-130-495-91	ALUMINUM ELECTRIC	4.7uF	50V
C214	1-124-463-11	ALUMINUM ELECTRIC	0.1uF	50V
C215	9-909-680-01	CERAMIC	1000PF	1kV
C216	9-909-680-01	CERAMIC	1000PF	1kV
C217	1-130-491-51	FILM	0.047uF	50V
C218	1-126-942-11	ALUMINUM ELECTRIC	1000uF	25V
C219	1-126-942-11	ALUMINUM ELECTRIC	1000uF	25V
C220	1-130-467-11	FILM	470PF	50V
C221	1-130-467-11	FILM	470PF	50V

< CONNECTOR >

CN051	1-695-342-11	CONNECTOR 19P		
CN052	1-506-473-11	CONNECTOR 8P		
CN053	1-564-506-11	CONNECTOR 3P		
CN101	1-564-419-11	CONNECTOR 2P		

< DIODE >

Ref. No.	Part No.	Description	Remarks
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
⚠D101	8-719-510-19	BRIDGE DIODE D2SBA60	
⚠D102	9-902-050-01	DIODE ERA15-06	
⚠D103	8-719-030-25	DIODE EG01C (A3)	
⚠D103	9-900-512-01	DIODE AG01A (550/650)	
⚠D104	9-900-514-01	DIODE MA165	
⚠D105	9-900-535-01	DIODE AU02Z	
⚠D201	8-719-510-72	DIODE S3L20U	
⚠D202	8-719-510-72	DIODE S3L20U	
⚠D203	8-719-510-72	DIODE S3L20U	
⚠D204	8-719-043-74	DIODE AK04	
⚠D205	9-900-514-01	DIODE MA165	
⚠D206	9-900-514-01	DIODE MA165	
⚠D208	8-719-200-82	DIODE 11ES2	
⚠D209	8-719-035-04	ZENNER DIODE MA4240	

< FUSE >

⚠F101	1-532-286-11	FUSE TIME LUG (3.15A 250V) (A3)	
⚠F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (550/650)	

< IC >

IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC NJM4558M	
⚠IC101	8-759-062-58	IC FA5311S	
⚠IC201	8-759-701-79	IC NJM78M12FA	
⚠IC202	8-759-929-65	IC LM7912CT	
⚠IC203	9-900-532-01	IC AN1431T	
⚠IC204	8-759-100-96	IC NJM4558M	

< COIL >

L051	1-424-219-11	CHORKE COIL 300uH	
⚠L101	9-909-675-01	LINE FILTER	
⚠L102	9-909-675-01	LINE FILTER	(A3)
⚠L103	9-904-796-01	BEAD CORE	
⚠L201	9-909-681-01	CHORKE COIL 10uH	
⚠L202	9-909-681-01	CHORKE COIL 10uH	
⚠L204	9-909-681-01	CHORKE COIL 10uH	
⚠L205	9-909-681-01	CHORKE COIL 10uH	

< PHOTO COUPLER >

⚠PC101	9-909-676-01	PHOTO COUPLER (A3)	
⚠PC101	9-900-519-01	PHOTO COUPLER (550/650)	
⚠PC102	9-909-677-01	PHOTO COUPLER (A3)	
⚠PC102	9-900-519-01	PHOTO COUPLER (550/650)	

Note: The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

POWER BLOCK

Ref. No.	Part No.	Description			Remarks
		< IC LINK >			
⚠PS051	1-532-675-91	IC LINK (ICP-N38 1.5A)			
⚠PS052	1-532-675-91	IC LINK			
		< TRANSISTOR >			
⚠Q051	8-729-117-11	TRANSISTOR	2SB1151		
⚠Q052	8-729-019-31	TRANSISTOR	2SC4596		
⚠Q053	8-729-117-11	TRANSISTOR	2SB1151		
⚠Q054	8-729-019-31	TRANSISTOR	2SC4596		
Q055	8-729-119-78	TRANSISTOR	2SC3311		
Q056	8-729-230-46	TRANSISTOR	2SA1162		
Q058	8-729-230-49	TRANSISTOR	2SC2712		
Q059	8-729-230-46	TRANSISTOR	2SA1162		
Q060	8-729-230-49	TRANSISTOR	2SC2712		
Q061	8-729-119-76	TRANSISTOR	2SA1309		
⚠Q101	9-909-669-01	TRANSISTOR	2SK1547		(A3)
⚠Q101	9-933-750-01	TRANSISTOR	2SK1102		(550/650)
⚠Q201	8-729-021-99	TRANSISTOR	2SB1416		
⚠Q202	8-729-119-78	TRANSISTOR	2SC1740		
⚠Q203	8-729-119-76	TRANSISTOR	2SA933		
⚠Q204	9-909-678-01	TRANSISTOR	2SC4545		
⚠Q206	8-729-900-80	TRANSISTOR	UN4211		
		< RESISTOR >			
R050	1-216-097-11	THICK FILM	100K		1/10W
R051	1-216-081-11	THICK FILM	22K		1/10W
R052	1-216-075-11	THICK FILM	12K		1/10W
R053	1-216-093-11	THICK FILM	68K		1/10W
R054	1-216-105-11	THICK FILM	220K		1/10W
R055	1-216-091-11	THICK FILM	56K		1/10W
R057	1-216-093-11	THICK FILM	68K		1/10W
R061	1-216-089-11	THICK FILM	47K		1/10W
R062	1-216-065-11	THICK FILM	4.7K		1/10W
R063	1-216-049-11	THICK FILM	1K		1/10W
R064	1-247-750-11	CARBON	680	5%	1/2W
R065	1-247-750-11	CARBON	680	5%	1/2W
R066	1-216-049-11	THICK FILM	1K		1/10W
⚠R067	1-216-369-51	METAL OXIDE FILM	1		2W
R068	1-219-387-11	THICK FILM	43K	0.1%	1/10W
R069	1-219-391-11	THICK FILM	47K	0.1%	1/10W
R070	1-219-387-11	THICK FILM	43K	0.1%	1/10W
R071	1-219-391-11	THICK FILM	47K	0.1%	1/10W
R072	1-216-073-11	THICK FILM	10K		1/10W
R073	1-216-073-11	THICK FILM	10K		1/10W
⚠R074	1-215-866-11	CARBON	330	5%	1W
R075	1-216-073-11	THICK FILM	10K		1/10W
R076	1-247-750-11	CARBON	680	5%	1/2W
R077	1-216-073-11	THICK FILM	10K		1/10W
R079	1-216-097-11	THICK FILM	100K		1/10W

Ref. No.	Part No.	Description			Remarks
R080	1-216-097-11	THICK FILM	100K		1/10W
⚠R101	9-900-394-01	NON-FLAMABLE CARBON	1M		1/2W (A3)
⚠R102	1-215-863-11	METAL OXIDE FILM	100K		1W (A3)
⚠R102	1-215-878-11	METAL OXIDE FILM	33K		1W (550/650)
⚠R103	1-215-863-11	METAL OXIDE FILM	100K		1W (A3)
⚠R103	1-215-878-11	METAL OXIDE FILM	33K		1W (550/650)
⚠R104	1-214-921-11	CARBON	220K		1/2W
⚠R105	1-214-921-11	CARBON	220K		1/2W (A3)
⚠R106	1-215-860-51	METAL OXIDE FILM	33K		1W (A3)
⚠R106	1-215-858-11	METAL OXIDE FILM	15		1W (550/650)
⚠R107	1-215-927-51	METAL OXIDE FILM	47K		3W (A3)
⚠R107	1-215-924-11	METAL OXIDE FILM	15K		3W (550/650)
⚠R108	1-212-974-11	NON-FLAMABLE CARBON	47		1/2W
⚠R109	9-909-670-01	METAL FILM	0.22		1/2W
⚠R110	9-909-671-01	CEMENT	0.1		2W (A3)
⚠R110	9-933-751-01	CEMENT	0.05		2W (550/650)
⚠R111	1-249-408-11	CARBON	180		1/4W
⚠R112	1-212-958-11	NON-FLAMABLE CARBON	10		1/2W
⚠R113	1-247-831-31	CARBON	2.2K		1/4W (550/650)
⚠R114	1-247-848-31	CARBON	5.1K		1/4W
⚠R115	1-247-855-31	CARBON	10K		1/4W
⚠R116	1-247-891-31	CARBON	330K		1/4W
⚠R117	1-247-891-31	CARBON	330K		1/4W
⚠R118	1-212-966-11	NON-FLAMABLE CARBON	22		1/2W
⚠R201	9-909-679-01	FUSE	0.22		1/4W
⚠R202	1-247-855-31	CARBON	10K		1/4W
R203	1-249-404-11	CARBON	82		1/4W
⚠R204	1-247-847-11	CARBON	4.7K		1/4W
⚠R205	1-247-847-11	CARBON	4.7K		1/4W
R206	1-249-404-11	CARBON	82		1/4W
⚠R207	1-247-855-31	CARBON	10K		1/4W
⚠R208	1-247-847-11	CARBON	4.7K		1/4W
⚠R209	1-247-847-11	CARBON	4.7K		1/4W
⚠R210	1-260-099-11	CARBON	1K		1/2W
⚠R211	1-247-839-31	CARBON	2.2K	5%	1/4W
⚠R212	1-247-839-31	CARBON	2.2K	5%	1/4W
R213	1-249-432-11	CARBON	18K		1/4W
R214	1-249-433-11	CARBON	22K		1/4W
⚠R215	1-247-855-31	CARBON	10K		1/4W
⚠R221	1-247-855-31	CARBON	10K		1/4W
R225	1-247-855-31	CARBON	10K		1/4W
⚠R226	1-247-871-11	CARBON	47K		1/4W
⚠R227	1-249-439-11	CARBON	68K		1/4W
		< SWITCH >			
⚠SW101	1-572-675-11	POWER SWITCH	(A3)		

Note:	**Note:**
The components identified by matk ⚠ or dotted line with m'ark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

POWER BLOCK | PW-721 | SW-732

Ref. No.	Part No.	Description	Remarks
		< TRANSFORMER >	
⚠T101	9-909-674-01	SWITCHING TRANSFORMER (A3)	
⚠T101	9-933-753-01	SWITCHING TRANSFORMER (550/650)	
		< THERMISTOR >	
⚠TH101	9-904-783-01	POWER THERMISTOR	
		< VARIABLE RESISTOR >	
⚠VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
⚠VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

****

Ref. No.	Part No.	Description	Remarks
*	A-6423-300-A	PW-721 BOARD, COMPLETE (A3)	
		***************************	
*	A-6423-307-A	PW-721 BOARD, COMPLETE (550/650)	
		*******************************	
		(Ref.No.3,000 Series)	
		< CAPACITOR >	
C001	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
CN001	1-506-485-11	PIN, CONNECTOR 6P	
		< DIODE >	
D002	8-719-992-30	LED SLR305MC3F (POWER) (550/650)	
D002	8-719-981-49	DIODE GL3ED8 (POWER) (A3)	
D003	8-719-992-30	LED SLR305MC3F (POWER) (550/650)	
D003	8-719-981-49	DIODE GL3ED8 (POWER) (A3)	
D006	8-719-302-07	LED SEL1810A (QUICK START)	
		< IC >	
IC001	8-749-923-11	IC GP1U58XB	
		< TRANSISTOR >	
Q002	8-729-901-05	TRANSISTOR DTA124EK	
Q003	8-729-901-05	TRANSISTOR DTA124EK (A3)	
		< RESISTOR >	
R005	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R006	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R007	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R010	1-216-037-00	METAL CHIP 330 5% 1/10W	
R011	1-216-037-00	METAL CHIP 330 5% 1/10W	(A3)
R012	1-216-037-00	METAL CHIP 330 5% 1/10W	(A3)
R013	1-216-037-00	METAL CHIP 330 5% 1/10W	
R014	1-216-037-00	METAL CHIP 330 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S005	1-762-365-21	SWITCH, TACTILE (QUICK START)	
S006	1-762-365-21	SWITCH, TACTILE (FL DISPLAY)	
S007	1-762-365-21	SWITCH, TACTILE (OPEN/CLOSE)	
S008	1-762-365-21	SWITCH, TACTILE (POWER)	

****

Ref. No.	Part No.	Description	Remarks
*	A-6423-303-A	SW-732 BOARD, COMPLETE	
		**********************	
		(Ref.No.4,000 Series)	
		< CONNECTOR >	
* CN461	1-565-042-11	HOUSING, CONNECTOR (PC BOARD) 5P	
		< JUMPER RESISTOR >	
JR461	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR462	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< PHOTO INTERUPTER >	
PH461	8-729-020-74	DIODE GP1S24	
PH462	8-729-020-74	DIODE GP1S24	
PH463	8-729-020-74	DIODE GP1S24	
		< RESISTOR >	
R461	1-216-194-00	METAL CHIP 680 5% 1/8W	
R462	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R463	1-216-039-00	METAL CHIP 390 5% 1/10W	
R464	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R465	1-216-248-00	METAL GLAZE 120K 5% 1/8W	

****

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		*************	
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR	
63	1-769-651-11	CABLE, FLAT (FFC) 13 ARBOR	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR	
⚠68	1-574-085-11	CORD, POWER (550/650)	
⚠68	1-575-912-21	CORD, POWER (A3)	
⚠168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
172	1-769-680-11	FLAT CABLE (FCC) (4 CORE)	
M421	X-3944-693-1	MOTOR ASSY, TILT	
M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

****

Note: The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remarks
	1-569-008-11	ADAPTER, CONVERSION 2P (A3:E)	
	1-575-334-11	CORD, CONNECTION (A/V CABLE) (1.5m)	
	1-770-019-11	ADAPTOR, CONVERSION (A3:Hongkong)	
	3-759-916-21	MANUAL, INSTRUCTION (ENGLISH) (550)	
	3-759-916-31	MANUAL, INSTRUCTION (FRENCH) (550)	
	3-759-918-11	MANUAL, INSTRUCTION (ENGLISH, CHINESE) (A3)	
	3-759-918-21	MANUAL, INSTRUCTION (ENGLISH) (650)	
	3-759-918-31	MANUAL, INSTRUCTION (FRENCH) (650)	
*	3-961-937-01	INDIVIDUAL CARTON (550)	
*	3-961-937-11	INDIVIDUAL CARTON (650)	
*	3-961-937-21	INDIVIDUAL CARTON (A3)	
*	3-963-326-01	CUSHION (UPPER)	
*	3-963-327-01	CUSHION (LOWER)	

****

****

HARDWARE LIST

****

Ref. No.	Part No.	Description	Remarks
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#3	7-685-645-79	SCREW +BVTP 3X6 TYPE2 IT-3	
#4	7-624-105-04	STOP RING 2.3, TYPE -E	
#5	7-671-155-01	STEEL BALL 3.0	
#7	7-685-103-19	SCREW +P 2X5 TYPE2 SLIT	
#8	7-621-759-65	+PSW, 2.6X8	
#9	7-628-253-05	SCREW +PS 2X4	
#10	7-682-946-09	SCREW +PSW 3X5	
#11	7-623-212-22	SW 5,TYPE 2	
#12	7-624-190-81	STOP RING 2, TYPE-CS	
#13	7-621-759-35	+PSW, 2.6X5	
#14	7-684-220-02	NUT 3, HEXAGON CAP	
#15	7-685-134-19	SCREW +P 2.6X8 TYPE 2 NON-SLIT	
#16	7-685-659-79	SCREW +P 4X8 TYPE 2 NON-SLIT	

SECTION 6
IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL MICROCOMPUTER (IC501: MB89094PF-G-141-BND on the MB-717 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Open connection).
2	CL0	I	32 kHz clock.
3	MOD0	I	(Connected to GND).
4	MOD1	I	(Connected to GND).
5	X0	I	2 fsc clock (7.159 MHz).
6	X1	O	2 fsc clock (Open connection).
7	VSS	I	GND.
8	$\overline{\text{MRST}}$	I	Mechanism controller reset signal (L: Reset).
9	$\overline{\text{FREQ}}$	I	Philips code (frame number) read enable.
10	FQACK	O	Philips code/Sub Q (sub code) data output control signal (H: Data output).
11	FQSEL	O	Philips code/Sub Q data switch (L: Sub Q).
12	JPCTRL	O	One track jump (1TJ)/Multi track jump (MTJ) switching signal (H: 1TJ).
13	SPLOCK	I	Spindle servo lock signal (H: The spindle servo is being locked).
14	TBCHOLD	O	Chroma TBC control signal.
15	SCOR	I	H when the sub code sync. is detected.
16	$\overline{\text{PB V}}$	I	Playback V sync signal input.
17	$\overline{\text{REF V}}$	I	Reference V sync signal input.
18	ALT	O	Signal output to latch the register A inside the expansion output port IC (IC502 on the MB-712 board).
19	BLT	O	Signal output to latch the register B inside the expansion output port IC (IC502 on the MB-712 board).
20	BUSY	I	Communication enable signal sent from the mode controller (L: Communication enabled).
21	DOP	I	Input signal from the video dropout detector (Not used)
22	VTM	I	V timing signal input for servo processor (Not used)
23	FLAG	I	Flag input enabling operation of reference system (Not used)
24	CDGIN	I	H at CDC mode. (Disc discrimination output from decoder IC) (Not used)
25	CLSCS	O	Chip select of the CLS DT (pin 29).
26	SPDLPLS	O	Pulse output to drive the spindle servo (H: The spindle runs free).
27	CLT	O	Output signal to latch the CLD register
28	CMOD	I	Input signal to select the start mode after reset is released (+ 5 V pull-up).
29	CLSDT	I	V sync. phase difference data input during CLV scan from IC502 (Data is input while the CLS CS is H).
30	SETDT	O	Serial data output to the DSP/expansion output port IC.
31	SETCK	O	Serial data transfer clock to the IC502, DSP.
32	SPDLFG1	I	Spindle FG input 1 (12 pulses per rotation).
33	GMUTE	O	Gray picture mute control output during CLV scan (L: playback picture, H: gray picture).
34	LD SEARCH	O	Spindle servo control signal output (H: LD search).
35	SPDL F/$\overline{\text{R}}$	O	Spindle rotation direction signal (H: FWD).
36	AUXSEL	O	H when signal is externally input (including CD-G). (Not used)
37	JMP TRIG	O	Track jump trigger pulse output.
38	MWRQ	O	Output signal requesting to download the memory picture (MDP-A3/650)
39	MEMORY	O	Output signal to switch between memory or through-out picture (MDP-A3/650)
40	MSTART	I	Memory picture downloading in progress (MDP-A3/650)
41	MTJ	I	MTJ tracking pulse output. This pin is normally set to input with Hi impedance. This pin is set to output when track jump (TJ) is in progress (L: FWD).
42	MTF ON/$\overline{\text{OFF}}$	O	MTF correction ON/OFF signal (H: MTF ON).
43	VLOAD	O	Output signal to latch the video IC (MN8811).
44	HSPD	O	Output signal to make easy to read H: p_code.
45	PMOFF	O	Output signal to phase-modulate the read-out clock H: OFF.
46		-	N. C.
47	BLK_LEVEL	O	Theater mode (H: ON) (MDP-A3/650)
48	XFL	I	Focus lock signal input (L: Focus is locked).
49	VCC	I	Power supply pin. REG + 5 V.
50	LINE_SEL	I	H: MMI is being connected to the FSIO.
51	CDG MUTE	O	Graphic data and mute (L: PB, H: Others) (Not used).
52	TILT UP	O	Tilt is enforced to move up.
53	TILT DOWN	O	Tilt is enforced to move down.
54	$\overline{\text{MMICS}}$	O	Serial communication chip select output signal to the mode controller.
55	LOADING	O	Output signal to activate the tray loading.
56	UN LOADING	O	Output signal to activate the tray ejecting.
57	CDG_XRST	O	Output signal to reset the CDG IC (Not used)
58	VSS	I	GND.
59	XLINE MUTE	O	Audio output mute signal (L: Mute).
60	DIG_0MUTE	I	Digital 0 muting information.
61	$\overline{\text{SV DSP RST}}$	O	Output signal to reset the servo, DSP and DF (L: Reset).
62	LD ON	O	Output signal to turn on or off laser diode (H: ON (lights)).
63	$\overline{\text{CD}}$/LD CDV	O	L: while playing back the audio part of CD or CDV. H: Others.
64	XSVLT	O	Output signal to latch the servo IC (HA11529).
65	SIDE A/B	O	Output signal to switch the disc side of the tilt servo (A: H. B: L).
66	BRK_INH	O	Output signal to control the servo brake mode.
67	LCSW1	I	Loading/chucking position sensor input-1.
68	$\overline{\text{LD LED}}$	O	LED illuminating signal output used to discriminate the type of disk (L: illuminating).
69	LCSW2	I	Loading/chucking position sensor input-2.
70	LCSW3	I	Loading/chucking position sensor input-3.
71	SPDL FG2	I	Spindle FG input-2 (Not used).
72	TILT LIMIT	I	Tilt up/down limits switch input.
73	TILT CTR	I	Tilt center position switch input.
74	MECH SI	I	32-byte serial transfer data input (used to check SCOR).
75		-	N. C.
76		-	N. C.
77	MECH SI	I	32-byte serial transfer data input (Input from the mode controller and IC502).
78	MECH SO	O	32-byte serial transfer data output (Output to the mode controller).
79	MECH CLK	O	32-byte serial transfer clock.
80	T CNT	I	Track jump counted input signal.
81		-	N. C.
82		-	N. C.
83	AVSS	I	GND.
84	LD DET	I	A/D input (Detects whether a disk is present or not, and disk size (8- or 12-inch)).
85	SLED1	I	A/D input sled position information (CDV).
86	SLED2	I	A/D input sled position information (CD, ALD and BLD).
87	TRAY_IM	I	Input to A/D when abnormality is detected in the tray drive motor.
88	$\overline{\text{DSPLT}}$	O	DSP IC latch signal.
89	MUTG	O	DSP mute signal (H: Mute).
90	EFM LOCK	I	Frame sync (EFM) lock signal (H: Locked).
91	SENSE	I	SENSE input signals from the DSPs.
92	AVCC	I	Power supply pin. Reg + 5 V.
93		-	N. C.
94	$\overline{\text{EMP ON}}$	O	Emphasis control output (H: Emphasis ON).
95	A MUTE 1	O	Audio L-channel output mode switch (H: Analog audio R mute).
96	A MUTE 2	O	Audio R-channel output mode switch (H: Analog audio L mute).
97	$\overline{\text{CX}}$	O	CX ON/OFF control signal output (L: CX ON).
98	DF_XMUTE	O	Digital filter · soft mute
99	$\overline{\text{DSPSEL}}$	O	Output signal to select communication with the DSP (L: Connect. H: Disconnect).
100	VCC	I	Power supply pin. REG + 5 V.

6-2. TERMINAL FUNCTION OF MODE CONTROL MICROCOMPUTER (IC102: MB89095 on the FP-746 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Connected at open)
2	CL0	I	32 kHz clock (Connected to GND)
3	MOD0	I	(Connected to GND)
4	MOD1	I	(Connected to GND)
5	X0	I	8 MHz clock
6	X1	O	8 MHz clock
7	VSS	I	GND
8	$\overline{\text{RST}}$	I	Mode controller reset. (L: Reset)
9	$\overline{\text{LED LD QUICK}}$	O	Output to LED (L: Illuminate)
10	$\overline{\text{LED CAPTION}}$	O	Output to LED (L: Illuminate) (Not used)
11	$\overline{\text{LED LINE IN}}$	O	Output to LED (L: Illuminate) (Not used)
12	$\overline{\text{LED AUTORESUME}}$	O	Output to LED (L: Illuminate)
13	$\overline{\text{LED DIGEST}}$	O	Output to LED (L: Illuminate)
14	$\overline{\text{LED THEATER}}$	O	Output to LED (L: Illuminate)
15	$\overline{\text{LED B}}$	O	Output to LED (L: Illuminate)
16	$\overline{\text{LED A}}$	O	Output to LED (L: Illuminate)
17	$\overline{\text{REF V}}$	I	Reference V sync. signal input
18	$\overline{\text{MMI CS}}$	I	Chip select signal sent from the mechanical controller to the mode controller
19	$\overline{\text{E2P BUSY}}$	I	EEPROM write signal. H: Ready. L: Busy
20		-	N. C.
21	$\overline{\text{LED STB}}$	O	(Not used)
22	PRACTICE	I	(Not used)
23	STUDY	I	(Not used)
24	$\overline{\text{AUX}}$	I	(Not used)
25	POUSE STOP	O	(Not used)
26	POSITION 1	O	(Not used)
27	POSITION 2	O	(Not used)
28	CMOD	I	Input selecting start mode after reset is released (+ 5 V pull-up)
29	SI	I	Received data from the EEPROM
30	SO	O	Send data to the EEPROM
31	SCK	O	Communication clock to the EEPROM
32	SIRCS	I	SIRCS input
33	$\overline{\text{CG CS}}$	O	CG chip select (L: During communication)
34	$\overline{\text{MRST}}$	O	Reset output to mechanism controller (L: Reset)
35	BUSY	O	Transfer enable signal from mode controller to mechanism controller (L: Communication enabled)
36	$\overline{\text{CDG CS}}$	-	N.C.
37	P. CONT	O	Control output to turn ON/OFF the main power of the machine
38	AU MUTE	O	H: During audio mute
39	P1	O	Output to FL segment
40	P2	O	Output to FL segment
41	P3	O	Output to FL segment
42	P4	O	Output to FL segment
43	P5	O	Output to FL segment
44	P6	O	Output to FL segment
45	P7	O	Output to FL segment
46	P8	O	Output to FL segment
47	P9	O	Output to FL segment
48	P10	O	Output to FL segment
49	VCC	I	Power supply pin. EVER + 5 V
50	P11	O	Output to FL segment

Pin No.	Signal	I/O	Function
51	P12	O	Output to FL Segment
52	P13	O	Output to FL Segment
53	VFDF	I	High durability pull-down power supply terminal. −30V
54	P14	O	Output to FL Segment
55	P15	O	Output to FL Segment
56	P16	O	Output to FL Segment
57	P17	O	Output to FL Segment
58	VSS	I	GND.
59	P18	O	Output to FL Segment
60	P19	O	Output to FL Segment
61	P20	O	Output to FL Segment
62	P21	O	Output to FL Segment
63	P22	O	Output to FL Segment
64	P23	O	Output to FL Segment
65		O	N.C.
66		-	N.C.
67	VCC	I	Power supply pin. EVER + 5 V.
68	7G	O	Output to FL degite
69	6G	O	Output to FL degite
70	5G	O	Output to FL degite
71	4G	O	Output to FL degite
72	3G	O	Output to FL degite
73	2G	O	Output to FL degite
74	1G	O	Output to FL degite
75	LINE SELECT	O	H: Communication with the mechanical controller. L: Communication with the CG
76		-	N.C.
77	MECH SO	I	Data input from the mechanical controller
78	MECH SI	O	Data output to the mechanical controller and CG
79	MECH CLK	O	Communication clock output for the mechanical controller and CG.
80	DOOR SW	O	Door switch (H: Close, L: Open)
81		-	N.C.
82		-	N.C.
83	AVSS	I	GND.
84	PS MON1	I	Input to A/D converter. Monitoring -5 V Regulated power supply
85	PS MON2	I	Input to A/D converter. Monitoring +5 V Regulated power supply
86	KEY L1	I	Input to A/D converter. Monitoring PW-721 key input
87		-	N.C.
88		-	N.C.
89	KEY R1	I	Input to A/D converter. Monitoring FW-747 key input.
90	J/E/UC	I	Input to A/D converter. Specifying shipping destination
91	PS MON3	I	Input to A/D converter. Monitoring ±12 V
92	AVCC	I	Power supply pin. EVER + 5 V.
93		-	N.C.
94		-	N.C.
95		-	N.C.
96	P. OFF	O	Controlling to turn OFF forcibly the switching power supply (H: Forced OFF) (Not used)
97	$\overline{\text{E2P WC}}$	O	EEPROM line control output.
98	$\overline{\text{E2P CS}}$	O	EEPROM chip select output.
99	TEST 1	I	Test pin (All LEDs illuminate if this pin is L during reset)
100	VCC	I	Power supply pin. EVER + 5 V.

SECTION 7

ELECTRICAL ADJUSTMENTS

During the adjustments, see the parts alignment diagram for adjustment on page from 7-16.

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- Remote commander (RMT-M33A/M37A/M37B)
- LD alignment disc HLV-8 (8-797-008-00) NTSC Ref. Disc 8

7-2. CAUTIONS ON ADJUSTMENT

- Disc load/unload operation must not be performed when servicing with the unit laying down sideways. (Never press the OPEN and CLOSE buttons.)
- When laying the unit down sideways, perform adjustment with the left side down and turn the power on.
- When adjusting the servo system, be sure to set up the unit horizontally.

7-3. OPERATION OF THE MDP-550/650/A3 WITH HIDDEN KEY FUNCTIONS

1. Explanation of the hidden key functions

Special control functions to be used for the test or some other purposes of the MDP-550/650/A3 are available by pressing at the same time and in specific order the multiple function keys on the main unit and/or on the remote control unit. The control functions available in this way are called "special key functions".

The special key functions can be used in either of the following modes.

- the service mode
- the debugging mode
- the normal operation mode

The special key functions can be divided into two groups according to the key control operations as follows:

- Simultaneous main-unit-key-press functions
  Some control functions can be used by pressing simultaneously multiple specific keys on the main unit.
- Simultaneous main-and-remote-control-units-key-press functions
  Some other control functions can be used by pressing simultaneously two specific keys on the remote control unit while holding down a specific key on the main unit.

2. How to use "simultaneous main-unit-key-press functions"

The functions available by pressing simultaneously the multiple specific keys only on the main unit are called "simultaneous main-unit-key-press functions". These functions are to be used when a quick operation such as "forced power off" is required.

The following table lists the currently available simultaneous main-unit-key-press functions.

Table 7-1. List of simultaneous main-unit-key-press functions

Keys to be pressed on the main unit	Functions
1 key and POWER key	(1) Forced power off This function turns off power forcibly. It is to be used if you want to turn off the power in the following cases. • Operation of the mechanisms is out of control. • Power cannot be turned off by pressing the power key. Note that this function should be used with care because it may turn off the power in a half way of the operation of the mechanisms.
STOP key and POWER key	(2) Forced reset This function carries out initialization of the mode controller in addition to the forced power off function. It is to be used if you want to reset the mode controller in the following case. Something is wrong with the mode controller such that it operates with incorrect display. Note that once this function has been carried out, all information, including the history of emergency case, other than the trap-flag information in the debugging mode, will be deleted.
B side key and CLEAR key (With power off only)	(3) Lighting up all the FL tubes and LEDs on the main unit. This function turns on all the FL tubes and LEDs after turning on the power automatically. Until you switched off the power, normal operation is possible while all the FL tubes LEDs are lit.

3. How to use "simultaneous main-and-remote-control-units-key-press functions"

The functions available by pressing the two specific keys on the remote control unit while holding down the specific key on the main unit are called "simultaneous main-and-remote-control-units-key-press functions". It is necessary to press two keys on the remote control unit within about one second. This prevents an accidental use of these functions by the user.

These functions are to be carried out by using the FL DISPLAY key so that the operation of the mechanisms is not affected.The following table lists the currently available simultaneous main-and remote control-units-key-press functions.

Table 7-2. List of simultaneous main-and-remote-control-units-key-press functions

Step	Keys to be pressed on the main unit and on the remote control unit	Functions
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and STOP key (remote control unit)	(1) Debugging mode ON/OFF This function puts the unit in the debugging mode from another mode, or puts the unit in the mode other than the debugging mode from the debugging mode. For details on the debugging mode, refer to 7-5. "OPERATION OF THE MDP-A550 IN THE DEBUGGING MODE".
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and +10 key (remote control unit)	(4) Make mechanism controller time out ineffective. Make the function turning power off ineffective when communication with mechanism controller cannot be done. When mechanism controller doesn't operate, it used to hasten to operate mode controller.
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and 0 key (remote control unit)	(5) Make mechanism controller time out effctive. Make the function turning power off effective when communication with mechanism controller cannot be done.
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and REPEAT key (remote control unit)	(6) EEPROM Clear It can be reserved that the EEPROM content is all cleared instead of storing the favorite program data or debug mode data when the main power is turned off. This operation is effective only when the main power is on.

7-4. OPERATION OF THE MDP-550/650/A3 IN THE SERVICE MODE

1. Explanation of the service mode

The functions for the use on reparation and maintenance (the service mode) are incorporated in the MDP-550/650/A3. The mode in which those functions are available is called "the service mode". The following are the differences between the service mode and the normal operation mode.

(1) Special operations such as focusing search and sledding can be carried out.

(2) Power is not turned off automatically in an emergency condition of power off.

(3) When entering the service mode, also the debugging mode is started automatically. (For details of the debugging mode, refer to 7-5. "OPERATION OF THE MDP-550/650/A3 IN THE DEBUGGING MODE".

2. Entering the service mode

The following procedure shows how to enter the service mode.

(1) While the power is turned off, connect the test pin (TP501 for service mode setting : Pin ③ of CN502), on the MB board of the main unit, to the ground

(2) Turn on the power by pressing the power key of the main unit. Nothing is displayed on the screen at this moment.

(3) Disconnect the test pin (the connection was performed in step (1) above) from the ground.
If the version number of microprocessor appears on the screen, the unit has already entered into the service mode. If it is not displayed, the unit has not entered in the service mode. If so, restart the procedure from step (1) above.
When the unit is in the service mode, it is also put in the debugging mode (the functions those available in both the modes can be used). For details of the debugging mode, refer to 7-5. "OPERATION OF THE MDP-550/650/A3 IN THE DEBUGGING MODE".

3. Quitting the service mode

To quits the service mode, press the power key and turn off the power. If you cannot turn off the power in this way (the operation of the mechanisms is not complete), carry out the forced power off function by pressing the reverse direction scan key and the power key on the main unit at the same time.

4. Operating with the special key functions

The special key functions in the service mode are available only under NO DISC and STOP conditions, for safety purposes.
Check that the indication for those conditions is displayed without flashing on FL display or on the screen. In order to carry out the special key functions listed in table 7-3, in the status above, turn off the FL display by pressing the FL DISPLAY key on the remote control unit. And then press the desired key such as PLAY or PAUSE on the main unit.
The sledding motion with the SIDE A or SIDE B key is effective only while holding the Key pressed. However, the operation started with the other keys continues, once it is pressed, until you press the STOP key. While the unit is carrying out the special key function, the side-B LED of the main unit is lit.
Note that multiple special key functions cannot be started even if you press multiple keys at the same time.
When the FL display is turned off, some keys are not effective.
Be sure to turn on the FL display by pressing the FL DISPLAY key on the remote control unit, if you don't want to carry out the special key functions.

Table 7-3. List of the special key functions

Key	Special key functions
SIDE A	Sledding in reverse direction (downward)
SIDE B	Sledding in normal direction (upward)
PLAY	Focusing search
PAUSE	Tilt servo ON
STEP FWD	Tray aging starts
STEP REV	Sled aging starts
REPEAT A/B	Tilt aging starts
STOP	Stop special operations

The following are the details of the special key functions available with the MDP-550/650/A3.

(1) SIDE A key for sledding in reverse direction
The sled can be moved in reverse direction (center of side B, to edge of side B, to edge of side A, and then to center of side A) after completing initialization of the tilt (the tilt is placed in neutral position) by holding down the SIDE A key. To stop the sledding in reverse direction, release the SIDE A key.

(2) SIDE B key for sledding in normal direction
As contrary to item (2) above, the sled can be moved in normal direction (center of side A, to edge of side A, to edge of side B, and then to center of side B). This movement of the sled is desired when replacing the optical part. To stop the sledding in normal direction, release the SIDE B key.

(3) PLAY key for focusing search
Focusing search operation can be carried out repeatedly by keeping pressing the PLAY key. There is no fault with the unit if the pick-up lens moves up and down.
Be sure to start the focusing search operation after checking the condition that the sled is placed in appropriate position (at around the center of side A). To stop the focusing search operation, press the STOP key.

(4) PAUSE key for tilt servo ON
The tilt servo is activated while pressing the PAUSE key. Move the sled to around the center of side A with the SIDE A and SIDE B keys, and put a CD or equivalent on the tray so that it screens the skew sensor. Then, if the tilt moves by pressing the PAUSE key, operation is normal.
The tilt can be placed back in neutral position by moving the sled with the SIDE A and SIDE B keys. To deactivate the tilt servo, press the STOP key.

(5) STEP FWD --- Tray aging starts.
If STEP FWD key is pressed, tray aging starts. Tray will automatically moves out and in. Take care that the tray will not collapse with surrounding objects.
Press STOP key to terminate aging.

(6) STEP REV --- Sled aging starts.
If STEP REV key is pressed, sled aging starts. Sled will automatically travels between side A and side B.
Press STOP key to terminate aging.

(7) REPEAT A/B --- Tilt aging starts.
If REPEAT A/B key is pressed, tilt aging starts. Tilt will automatically moves up and down.
Press STOP key to terminate aging.

7-5 OPERATION OF THE MDP-550/650/A3 IN THE DEBUGGING MODE

1. Explanation of the debugging mode

The contents in the RAM of the microprocessor can be displayed on the screen for the repair and maintenance purposes. The status of the MDP-550/650/A3 in which this debugging function is available is called "the debugging mode".
The following are the differences between the debugging mode and the normal operation mode.

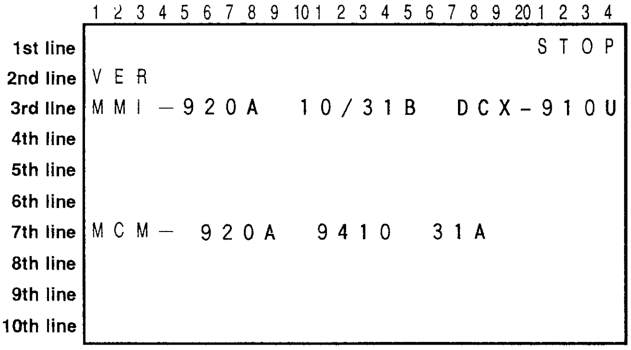
(1) If the debug key is effective, background color of the screen becomes abnormal. (Cross-pattern will appear in same cases.)

(2) Under the status described item (1) above, pressing the key on the remote control unit displays the history of emergency conditions or other debugging information.
Some keys are not effective when the background color of the screen is green.

2. Entering the debugging mode

To enter the debugging mode from a normal operation mode (in a normal status of operation), turn on the unit, press the 0 and STOP keys on the remote control unit while holding down the FL DISPLAY key on the main unit. When the following display appears on the screen, the unit is in the debugging mode. This display shows the version No. of the microprocessor. For details, refer to 5. (1) "[FRAME/TIME] key for displaying version No. of the microprocessor".

As long as the machine stays in the debug mode, the FL DISPLAY key has only the function to turn ON and OFF the debug command. While the debug command remains effective, the 7-segment display is not illuminated.



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                          S T O P
2nd line  V E R
3rd line  M M I - 9 2 0 A   1 0 / 3 1 B   D C X - 9 1 0 U
4th line
5th line
6th line
7th line  M C M -  9 2 0 A   9 4 1 0   3 1 A
8th line
9th line
10th line
```

Fig. 7-1. Initial display in the debugging mode

3. Quitting the debugging mode

To quits the debugging mode, press the CLEAR key on the remote control unit when the menu (version No. of the microprocessor indication on the screen with abnormal background color in figure (7-1) is displayed.

4. Changing the display on the screen

The display is set for "debugging display" immediately after entering the debugging mode. The display mode can be changed in the same manner as in the norrnal operation mode by pressing the screen display key. In the debugging mode, however, "debugging display" mode can be selected as one of the display modes, in addition to "no display (displays nothing in most cases)", "small display (displays only the 1st line in most cases)", and "large display (displays full screen in most cases)" modes.
Pressing the screen display key in the normal operation mode changes the display mode as follows:

No display → Small display → Large display →

Pressing the screen display key in the debugging mode changes the display mode as follows:

No display → Small display → Large display → Debugging display

5. Explanation of the debugging display

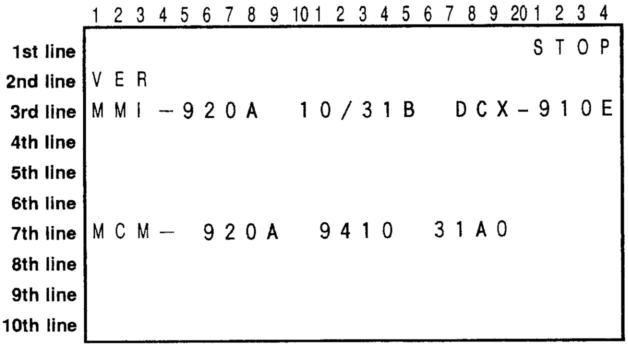
In the debugging display mode, the information on the mode controller is displayed on the screen as a dump list. The title is displayed at the left on the 2nd line from the top. The data is displayed on the 3rd line through the 9th line.
The display of the data in one line consists of up to four sets (total of 8 bytes) of four character (2 bytes character each) sets in hexadecimal notation.

The information to be displayed can be selected in the debugging mode, by first turning off the FL displays and pressing the desired key (as listed below).
The following table lists the information which are currently available and which can be displayed.

Table 7-4. List of the keys to be used in the debugging mode and corresponding information

Keys	Information to be displayed
[FRAME/TIME]	Version No. of the microprocessor
[1]	History of the function modes
[2]	History of the emergency occurrence
[3]	Information for repair service of normally
[4]	Trap-flag
[5]	Key/remote control data
[7]	Information on communication with the mechanism controller

(1) [FRAME/TIME] key for displaying version No. of the microprocessor
Pressing this key displays the version No. of the microprocessor. The version No. of the mode controller appears on the 3rd line, and that of the mechanism controller appears on the 7th line. An example in figure 7-2 shows that the version No. of the mode controller is "MMI-920A 10/31B" and that of the mechanism controller is "MCM-920A 94/10/31AO".



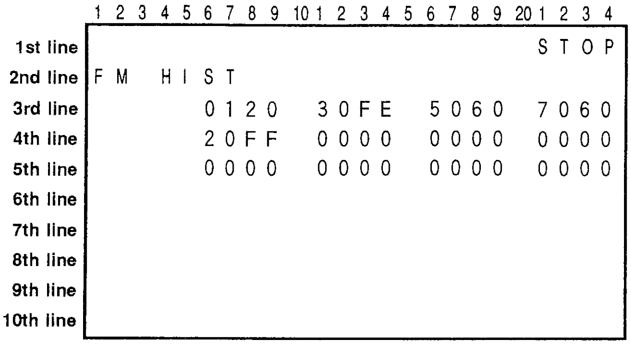
```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                          S T O P
2nd line  V E R
3rd line  M M I - 9 2 0 A   1 0 / 3 1 B   D C X - 9 1 0 E
4th line
5th line
6th line
7th line  M C M -  9 2 0 A   9 4 1 0   3 1 A 0
8th line
9th line
10th line
```

Fig. 7-2. Version No. of the microprocessor

(2) [1] key for displaying the history of the function modes
Pressing this key displays the history of the principal operation commands (which represent function modes) sent from the mode controller to the mechanism controller.
Up to 8 histories of the function modes can be displayed on a line. A total of 16 histories of the function modes are available using two lines. Unless the unit is unplugged, the data are kept intact in memory even when the unit is turned off.
The data to be stored appears on the screen from left to right 1 byte by 1 byte, and "FF" appears to the right of the last data byte. The data byte continues from the right end on the 1st line to the left end on the 2nd line, and from the right end on the 3rd line to the left end on the 1st line.
The last stored data of the function modes (which is the mode selected at present) appears on the left of "FF".

That is, when "FF" appears at the left end on the 1st (or 2nd, or 3rd) line, the last stored data appears at the right end on the 3rd (or 1st or 2nd) line.

"FE" means there has been an emergency case at the data point. To check the type of the emergency case, refer to 5. (3) "[2] key for displaying the history of the emergency occurrence".



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                          S T O P
2nd line  F M   H I S T
3rd line              0 1 2 0  3 0 F E  5 0 6 0  7 0 6 0
4th line              2 0 F F  0 0 0 0  0 0 0 0  0 0 0 0
5th line              0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-3. History of the function modes

Figure 7-3 shows that the function modes have changed as follows:

01 (Power on start up)
→ 20 (Stop)
→ 30 (Start up of side A)
→ FE (An emergency occurred.)
→ 50 (Searching a chapter)
→ 60 (Playback)
→ 70 (Slow speed scanning in normal direction)
→ 60 (Playback)
→ 20 (Stop) [The last function mode]

Table 7-5 lists the function modes.

Table 7-5. List of the function modes

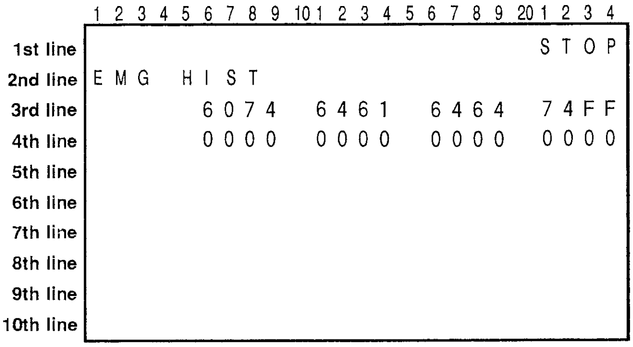
00	Power OFF
01	Power ON and start up
10	Open
20	Stop
30	Preparation for playback of side A
40	Preparation for playback of side B
50	Searching a chapter
51	Searching a frame/time
60	Playback
61	Pause
70	Slow speed scanning in normal direction
71	High speed scanning in normal direction
72	Slow speed scanning in reverse direction
73	High speed scanning in reverse direction
80	Still playback in normal direction
81	Step playback in normal direction
82	1/90 times speed playback in normal direction
83	1/30 times speed playback in normal direction
84	1/16 times speed playback in normal direction
85	1/8 times speed playback in normal direction
86	1/4 times speed playback in normal direction
87	1/2 times speed playback in normal direction
88	Normal (1 time) speed playback in normal direction
89	2 times speed playback in normal direction
8A	3 times speed playback in normal direction
8B	5 times speed playback in normal direction
8C	10 times speed playback in normal direction
90	Still playback in reverse direction
91	Step playback in reverse direction
92	1/90 times speed playback in reverse direction
93	1/30 times speed playback in reverse direction
94	1/16 times speed playback in reverse direction
95	1/8 times speed playback in reverse direction
96	1/4 times speed playback in reverse direction
97	1/2 times speed playback in reverse direction
98	Normal (1 time) speed playback in reverse direction
99	2 times speed playback in reverse direction
9A	3 times speed playback in reverse direction
9B	5 times speed playback in reverse direction
9C	10 times speed playback in reverse direction
FE	Appears for indicating an occurrence of emergency
FF	Appears next to the last data.

(3) [2] key for displaying the history of the emergency occurrence

Pressing this key displays the history of the emergency occurrence with the codes sent from the mechanism controller to the mode controller.

The data will be "00" if there has been no emergency case since when the unit has been plugged in.

The display type is the same as that for the history of the function modes. However, up to 16 histories using only two lines are available in this case. The emergency code which appears just before "FF" corresponds to the data of "FE" in the history of the function modes, which is the closest one to "FF".



```
           1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                             S T O P
2nd line   E M G   H I S T
3rd line           6 0 7 4   6 4 6 1   6 4 6 4   7 4 F F
4th line           0 0 0 0   0 0 0 0   0 0 0 0   0 0 0 0
5th line
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-4. History of emergency

Figure 7-4 shows that the emergency has occurred in the following order because the data next to "FF" is 60 on the left of the line.

60 (Detection of lead-in point)
→ 74 (Focusing failed)
→ 64 (Detection of minimum chapter)
→ 61 (Detection of lead-out point)
→ 64 (Detection of minimum chapter)
→ 64 (Detection of minimum chapter)
→ 74 (Focusing failed) [The last emergency]

Table 7-6 lists the emergency codes.

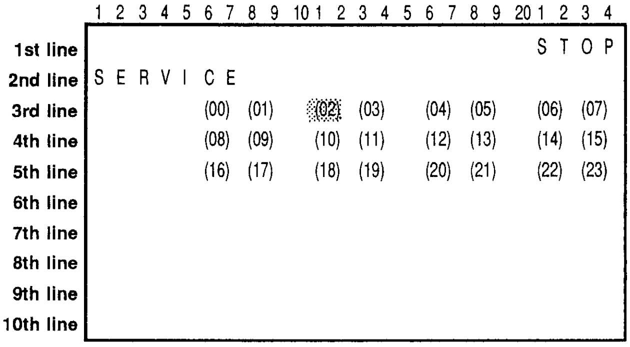
Table 7-6. List of the emergency codes

		Operation after occurence
	• For operation of forced modes condition	
01	Requirement of forced power off	Power off
02	Requirement of forced ejection of the tray	Eject
03	Requirement of stop	Stop
04	Requirement of stop when opening the door	Stop
05	Requirement of forced playback	Play
06	Requirement of determination for mode change when power off	Freezes power off display
07	Requirement of power off after communication stops.	Power off
08	Front door does not open.	
09	Door opens in the mode other than tray open.	
	• For operation of mechanisms	
10	Detection of movement for pushing in the tray	Play
11	Detection of no movement of the tray	Power off
20	Detection of no movement of the sleder	Power off
30	Detection of no movement of the tilt	Power off
31	Avoidance treatment execution of no movement of the tilt.	None
	• For operation of Spindle control	
40	No detection of the spindle FG	Power off
41	No achievement of continuous servo lock from FG servo to H servo	Stop
42	Above the high rotation limit	Stop
43	Below the low rotation limit	Stop
44	No complete stop operation for the spindle movement	Power off
45	Time over error for the spindle control operation	Power off
	• For start up operation	
50	Focusing failed	Stop
51	Focusing failed (with a disc loaded)	Stop
52	Detected as if the disc was an LD	None
53	Focusing of 8 inches LD failed	Stop
54	Reading of TOC failed on a disc of CD or CDV	Stop
	• For playback operation	
60	Detection of the lead-in code	Play or soon
61	Detection of the lead-out code	Stop/Pause or soon
62	Detection of the lead-out of part A on CDV	Stop/Pause or soon
63	Detection of a picture stop	Still
64	Detection of the minimum chapter	None
65	Reading of sub code failed on a disc of CD or CDV	Stop
66	Reading of philips code failed and disc of LD	Stop
67	Avoidance treatment execution of locked group	None
	• For search operation	
70	Detection of over search	Play
71	Detection of under search	Play
72	Time over for the search operation	Play
74	Focusing failed during searching	Stop
76	Retry execution after focusing failed.	None
	• The following emergency occurs in mode contoller	
80	Emergency time out	Power off
81	Search time out	Play
82	Mechanism controller communication time out	Power off
86	Emergency of 12V power supply	Origin power off

(4) [3] key for displaying the information for repair service, sent from the mechanism controller
Pressing this key displays the information sent from the mechanism controller, which is necessarv for repair service. At present, the information listed in table 7-7 is available. Data numbers in the table correspond to the numbers on the 3rd line through the 5th line in figure 7-5.

Table 7-7. Information for repair service, sent form the mechanism controller

Data number	Data
(02)	Mode of mechanisms (internal mode of the mechanism controller) See the following section for details.



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                          S T O P
2nd line  S E R V I C E
3rd line            (00) (01)  (02) (03)  (04) (05)  (06) (07)
4th line            (08) (09)  (10) (11)  (12) (13)  (14) (15)
5th line            (16) (17)  (18) (19)  (20) (21)  (22) (23)
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-5. Information for repair service sent form the mechanism controller

- About the operation modes of the mechanisms
  The operation modes of the mechanisms are the basic operation mode in the mechanism controller. Those almost the same as those available with the unit as the function modes. But, there are several supplemental modes for the mechanisms.
  The table below shows the operation modes of the mechanisms.

Table 7-8. Operation modes of the mechanisms

Modes of the mechanisms	Functions
00	Power off
01	Initialization of the mechanism controller (Without operating the mechanisms)
03	In the process from power ON to power OFF
04	In the process from power OFF to power ON
05	Initialization of the mechanisms and related ICs.
10	Ejected status of the tray
11	In the process of ejection of the tray
12	In the process of loading of the tray
20	In stop status with the disc chucking up
21	In the process of chucking up form chucking of side A
22	In the process of chucking of side A from chucking up
23	In chucking status of side A
30	Until focusing of side A has been achieved
31	From lock of focusing to start-up of 0 search
32	In operation from side A/B to stop
33	In process of reversing side B form side A
40	Until focusing of side B has been achieved
50	Chapter search
51	Frame/Time search
60	Play
61	Pause
70	Slow speed normal direction scanning
71	High speed normal direction scanning
72	Slow speed reverse direction scanning
73	High speed reverse direction scanning
74	In the process of scanning completion
80—FF	(The same as function mode)

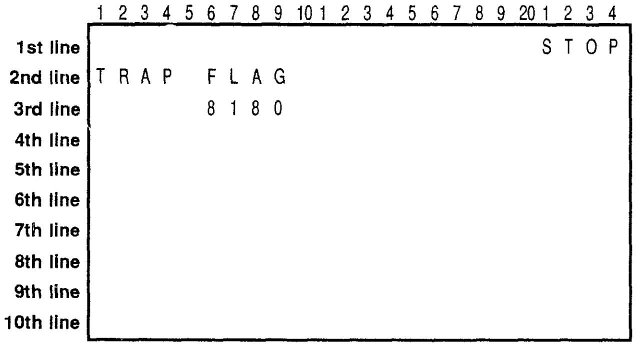
(5) [4] key for displaying the trap-flags

Pressing this key displays the cause of "an abnormal power off" of the mode controller (this excludes when it is turned off with the power key).

The one byte at the right (2 digits of hexadecimal notation) is the flag which has specific meaning. The bit which corresponds to the cause of the last abnormal power off is set 1.

The one byte at the left is the flag for all (logic OR of) the causes of abnormal power off since when the unit has been plugged in.

Both the flags can be set cleared by pressing the CLEAR key when the debug command remains effective.



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                          S T O P
2nd line  T R A P   F L A G
3rd line            8 1 8 0
4th line
5th line
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-6. Trap-flag

An example of the trap-flag shown in figure 7-6 shows that there have been two cases of abnormal power off before; 80 by abnormal voltage level and 01 by forced reset by the user (see the byte 81 in hexadecimal notation on the left). It also shows that the last abnormal power off has been caused by 80 (abnormal voltage level) (see the byte 80 in hexadecimal notation on the right).

Table 7-9. Trap-flag and bits and their meaning

Bit number (Pattern)	Causes
7 (80h)	Power off caused by abnormal voltage level
6 (40h)	Power off caused by abnormal communication with the mechanism controller
5 (20h)	Power off caused by an occurrence of emergency
4 (10h)	Forced power off by the key operation
3 (08h)	Resetting by self-check of the mode controller
2 (04h)	Resetting by self-check of the mode controller
1 (02h)	Resetting by self-check of the mode controller
0 (01h)	Forced resetting by the key operation

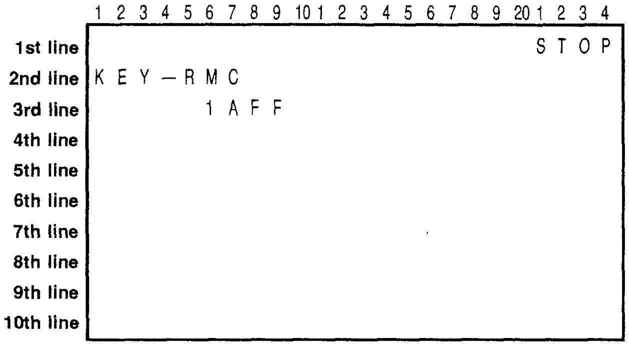
Note : Resetting, which is indicated with bits 0 to 3 in the table, means that setting the status of the mode controller back to the same status as that when the unit was plugged in, except for initialization of the trap-flag.

A of hexadecimal notation is 2+8. In the same manner, B=1+2+8, C=4+8, D=1+4+8, E=2+4+8, F=1+2+4+8.

(6) [5] key for displaying the key/remote control data

Pressing this key displays the key input data of the main unit and the input data by the remote control unit, using SIRCS codes. Note that this operation is effective on the remote control unit for MDPs only.

The one byte (2 digits in hexadecimal notation) on the left of the 3rd line in figure 7-7 is the SIRCS code of the key input data of the main unit, and that on the right is the SIRCS code of the input data by the remote control unit. When no key is pressed or there is no input, "FF" appears. When two keys are pressed almost at the same time, the SIRCS code of the input data by the first pressed key will appear.



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                          S T O P
2nd line  K E Y - R M C
3rd line            1 A F F
4th line
5th line
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-7. Key and remote control data

An example in figure 7-7 shows that the playback key (1A in hexadecimal notation) on the main unit is pressed but there is no input (FF in hexadecimal notation) from the remote control unit.

However, note that, in some cases, the remote control unit generates SIRCS codes momentarily only at the moment when the key is pressed.

Table 7-10. List of SIFRCS codes for MDPs

00	Numeral 1
01	Numeral 2
02	Numeral 3
03	Numeral 4
04	Numeral 5
05	Numeral 6
06	Numeral 7
07	Numeral 8
08	Numeral 9
09	Numeral 0
0B	Search/advance
0C	Frame/time
0F	Clear
15	Power ON/OFF
16	Close/open of tray
17	Audio monitoring
18	Stop
19	Pause
1A	Playback
1B	Rev. high speed scan
1C	Fwd. high speed scan
1E	Reverse direction scanning
1F	Normal direction scanning
20	Still
21	Speed up
22	Speed down
23	Forward variable playback
24	Reverse variable playback
28	Time display
29	Repeat
2B	Still/step in normal direction
2C	Still/step in reverse direction
30	Program
34	ACS in normal direction
35	ACS in reverse direction
38	REPEAT A · B
39	Numeral +10
3A	Screen display
40	Analog audio/CX
44	Return
47	1/single side/Both sides
4F	Forward middle speed playback
50	Forward middle/low speed playback
51	Forward low/low speed playback
52	Forward JOG step
55	Reverse JOG step
56	Reverse low speed playback
57	Reverse middle/low speed playback
58	Reverse middle/low speed playback
5D	side A
5E	side B
72	Picture call
(Followings are the extended codes.)	
81	FL display ON/OFF
82	LD quick start
9A	Quick viewing playback
A5	Hollywood mode selection
A6	Display position selection
FF	Appears when there is no input.

(7) [7] key for displaying the information on communication with the mechanism controller
Pressing this key displays the communication data with the mechanism controller.
The data transmitted from the mode controller to the mechanism controller appears on the 3rd line through the 5th line. The data transmitted from the mechanism controller to the mode controller appears on the 7th line through the 9th line. The exclamation marks [!] at the left on the 8th and the 9th lines indicate that the communication is carried out successfully. Question mark [?] appears if communication stops. A bracket mark [■] appears if communication stops after carrying out once the communication on the purpose of servicing.

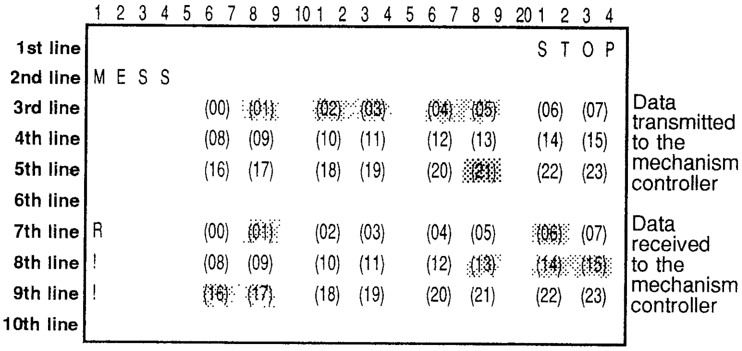

1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 20 1 2 3 4
1st line
2nd line
3rd line
4th line
5th line
6th line
7th line
8th line
9th line
10th line
S T O P
M E S S
(00) (01) (02) (03) (04) (05) (06) (07)
(08) (09) (10) (11) (12) (13) (14) (15)
(16) (17) (18) (19) (20) (21) (22) (23)
R (00) (01) (02) (03) (04) (05) (06) (07)
! (08) (09) (10) (11) (12) (13) (14) (15)
! (16) (17) (18) (19) (20) (21) (22) (23)
Data transmitted to the mechanism controller
Data received to the mechanism controller

Fig. 7-8. Information on communication with the mechanism controller.

The table below shows some communication information.

Table 7-11. Principal communication information

Data from the mode controller to the mechanism	
(01)	The function mode at present (next)
(02)	The function mode of final purpose
(03—05)	Target address of search (Time/Frame)
(21)	KARAOKE Door Position
Data from the mechanism controller to the mode controller	
(01)	The function mode at present (next)
(06)	The flag for completion of function mode change (0 bit)
(13)	Current chapter/track number
(14)	Current index number
(15—17)	Current address (Time/Frame)

7-6. POWER SUPPLY ADJUSTMENT

7-6-1. EVER +5V Adjustment (POWER BLOCK)

Mode	Stop
Measurement point	Pin ② of CN052 (Pin ⑦, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR201
Specified value	5.0 ± 0.3Vdc

Adjustment method :

1) Adjust VR201 to 5.0 ± 0.3V

7-6-2. REG +5V Adjustment (POWER BLOCK)

Mode	Stop
Measurement point	Pin ④ of CN052 (Pin ⑦ GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR202
Specified value	5.0± 0.3Vdc

Adjustment method :

1) Adjust VR202 to 5.0 ± 0.3V

7-6-3. Power Supply Check (POWER BLOCK)

Mode	Stop
Measuring equipment	Digital voltmater
UNREG +16V check	
Measurement point	Pin ⑪ of CN051 (Pin ⑫, GND)
Specified value	16.4 ± 1.5Vdc
UNREG -16V check	
Measurement point	Pin ⑭ of CN051 (Pin ⑬, GND)
Specified value	–15.3 ± 1.5Vdc
REG +12V check	
Measurement point	Pin ⑰ of CN051 (Pin ⑱, GND)
Specified value	12.0 ± 0.8Vdc
REG -12V check	
Measurement point	Pin ⑲ of CN051 (Pin ⑱, GND)
Specified value	–12.0 ± 0.8Vdc
REG -5V check	
Measurement point	Pin ⑥ of CN052 (Pin⑦, GND)
Specified value	–5.0 ± 0.3Vdc

- Confirm that the power supply voltages satisfy the respective specified values.

7-7. SYSTEM CONTROL SYSTEM ADJUSTMENT

7-7-1. Microprocessor Clock Adjustment (MB-717 Board)

Mode	Stop
Measurement point	Emitter of Q028 (Pin ⑰ of IC002)
Measuring equipment	Frequency counter
Adjusting element	CT001
Specified value	14318180 ± 40Hz

Adjustment method :

1) Adjust CT001 to 14318180 ± 40Hz.

7-8. SERVO SYSTEM ADJUSTMENT

7-8-1. LD Side A Tilt Balance Adjustment

1) Put the LD alignment disc HLV-8 in with the CAV side to the side A, play it and pause at the chapter 3 (#2201).
2) Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV401 so that the RF waveform goes maximum in the state the tracking and the sled are on.

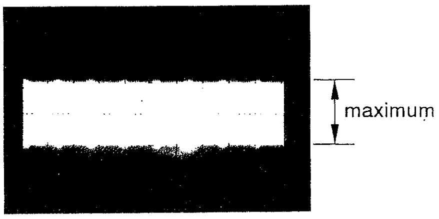


Fig. 7-10.

3) Play #770 and pause.
4) Check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and minimum.

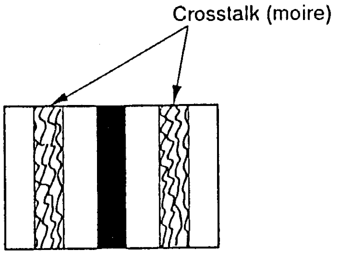
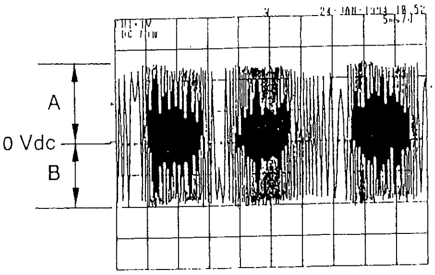


Fig. 7-11.

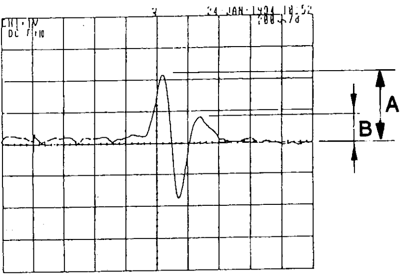
5) Tracking gain and focus gain adjustments are not necessary.
   — Already adjusted at the optical pick-up block side —
6) Check the tracking balance.
   Measure the registance at the Y terminal of TRACKING ERR on jig with oscilloscope.



Check that it meets $-5 \leqq \frac{A-B}{2(A+B)} \times 100\ (\%) \leqq 8$

Fig. 7-12.

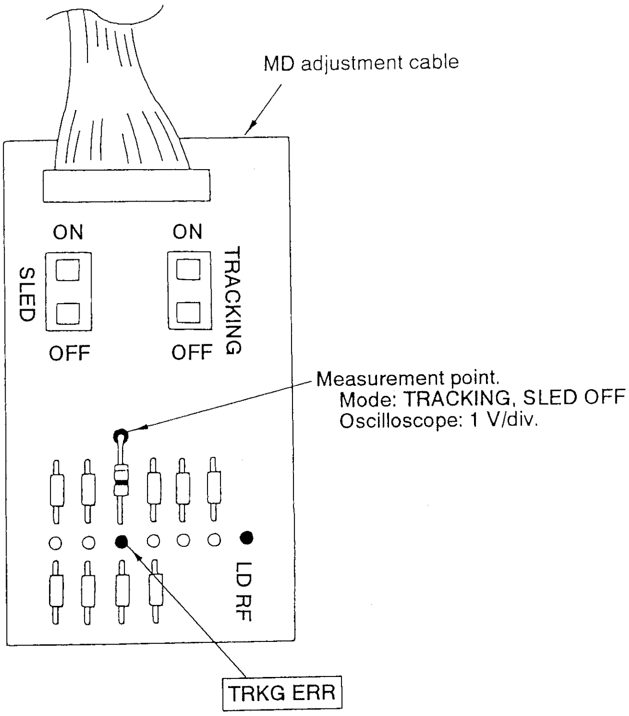
7) Then turn on the TRACKING and SLED to check the waveform of 1 track jump in STILL.



Check that it meets $B \leqq \frac{1}{2}A$

Fig. 7-13.

Check the TRACKING BALANCE.



Measurement point.
Mode: TRACKING, SLED OFF
Oscilloscope: 1 V/div.

Fig. 7-14.

7-8-2. LD Side B Tilt Balance Adjustment

1) Loosen the side B RD screw and TAN screw (hexagonal screw 2.6) on the feed base.
2) Put the LD alignment disc HLV-8 in with the CAV side to the side B, play it and pause at the chapter 3 (#2201).
3) Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV402 so that the RF waveform goes maximum in the state the tracking and the sled are on.

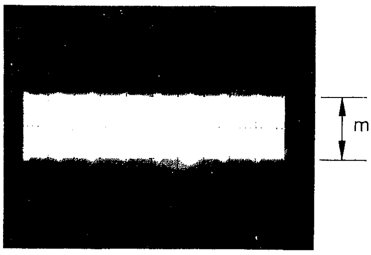
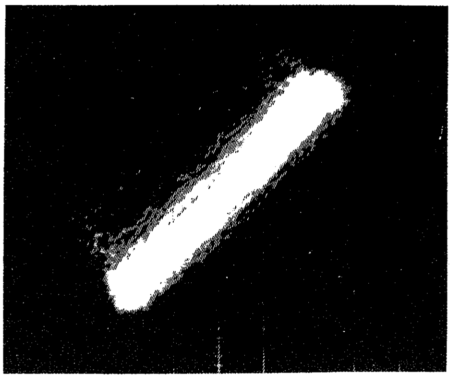


Fig. 7-15.

4) Insert an eccentric screwdriver to B TAN adjustment hole and adjust the RF waveform goes maximum similarly to the item 4).
5) Play #770 and pause.
   At this time in the same manner as the side A, check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and maximum.

6) Turn off the SLED and tracking, and adjust inserting an eccentric screwdriver to B RD adjustment hole so that the Lissagous waveform meets standard.



Jig terminal : E, F
Oscilloscope : X/Y lissagous 20 mV/div.
Phase difference : Within 35°

Fig. 7-16.

7) Take out the disc to tighten B TAN and RD screw.

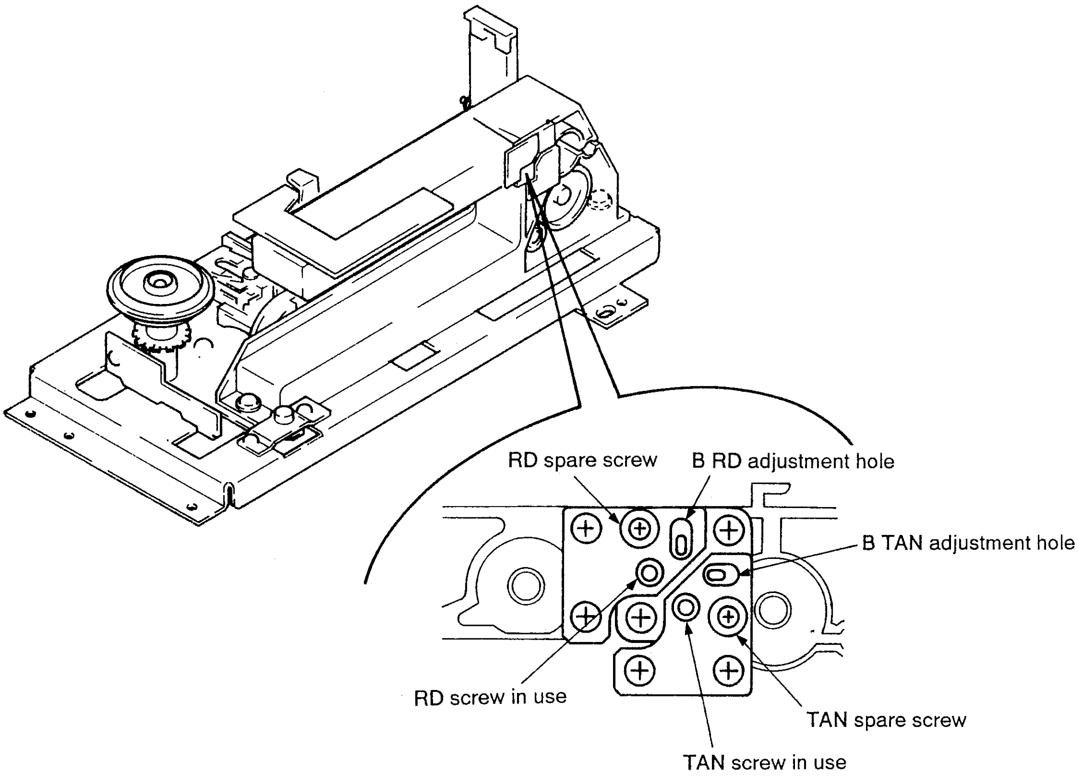


Fig. 7-17.

7-9. VIDEO SYSTEM ADJUSTMENT

7-9-1. Video Output Level Adjustment (MB-717 Board)

Mode	Still
Signal	Frame 4100 (Color bar)
Measurement point	J203 (VIDEO OUT terminal) (Terminated to 75Ω)
Measuring equipment	Oscilloscope
Adjusting element	RV001
Specified value	1.00 ± 0.02 Vp-p

Adjustment method :

1) Select STILL (▶|◀) mode.
2) Search the frame 4100 and apply a color bar signal.
3) Adjust RV001 for 1.00 ± 0.02 Vp-p.

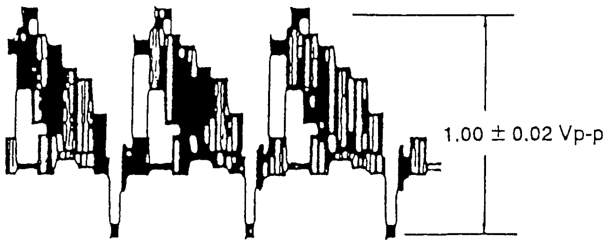


Fig. 7-18.

7-10. ADJUSTMENT AFTER THE ATTACHMENT OF THE OPTICAL PICK-UP BLOCK

7-10-1. Jigs and Tools

- Hexagonal wrench (Tangential screwdriver: 7-700-766-04)
- Oscilloscope
- MD adjustment cable (J-6082-059-B)
- Alignment disc Ref. 8 (HLV-8: 8-797-008-00)/LD YEDS-18 (3-702-101-01) or an equivalent/CD
- Decentering screwdriver 4 ø (J-6095-029-A)

* Insert the terminal of the connector conversion jig to CN401 of the MB-717 Board.

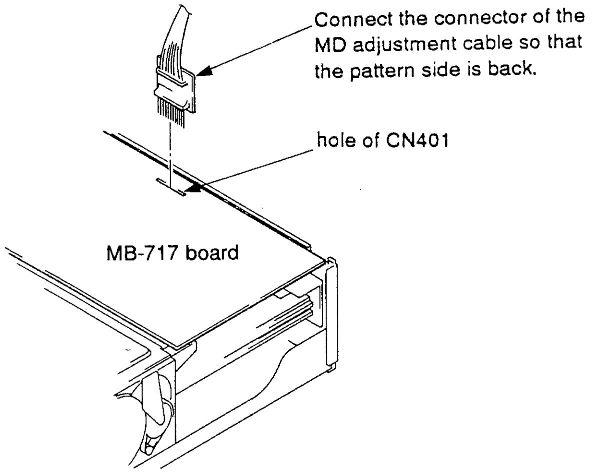

Connect the connector of the MD adjustment cable so that the pattern side is back.
hole of CN401
MB-717 board

Fig. 7-19.

7-10-2. CD Adjustment

1) Loosen the screws of feed base block assembly.

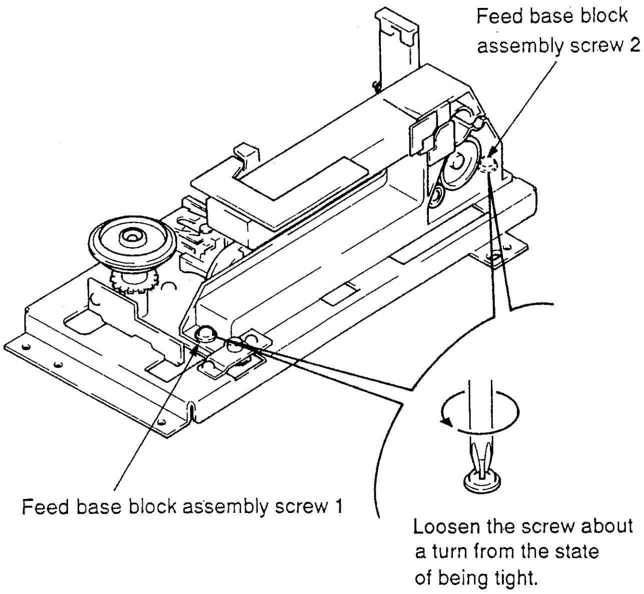

Feed base block assembly screw 2
Feed base block assembly screw 1
Loosen the screw about a turn from the state of being tight.

Fig. 7-20.

2) Playback the CD alignment disc (YEDS-18) to press the Pause button about 3 seconds later.
3) Connect the oscilloscope to LD RF of the MD adjustment cable to see if the waveform shown below appears.

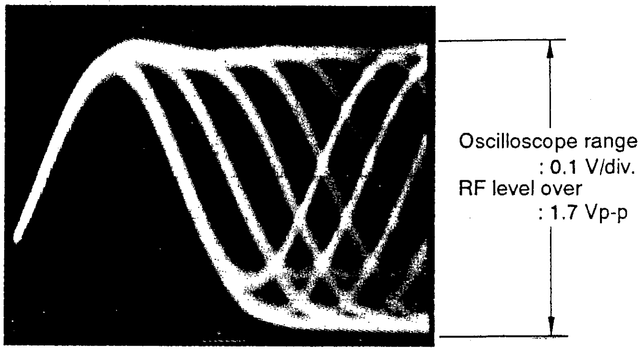


Fig. 7-21.

4) Insert the A TAN screw with hexagonal wrench 2.6 into the hole of top surface of chucking assembly to adjust so that RF Level is maximum. (Over 1.7 Vp-p)

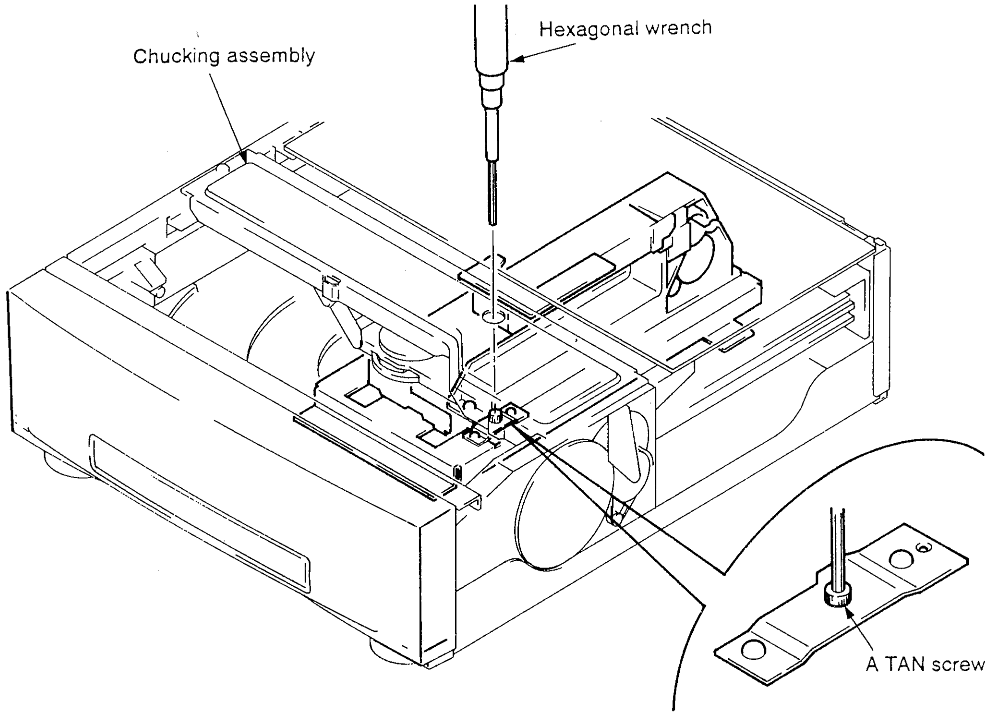
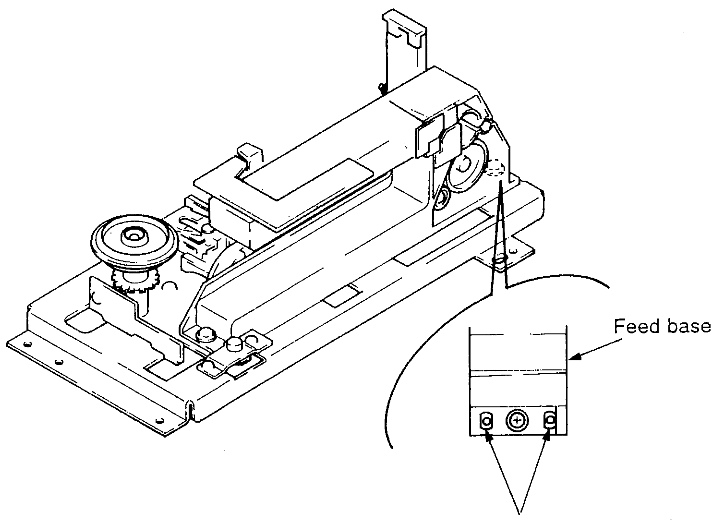

Chucking assembly
Hexagonal wrench
A TAN screw

Fig. 7-22.

5) Insert decentering screwdriver into the feed base block assembly for RD adjustment.



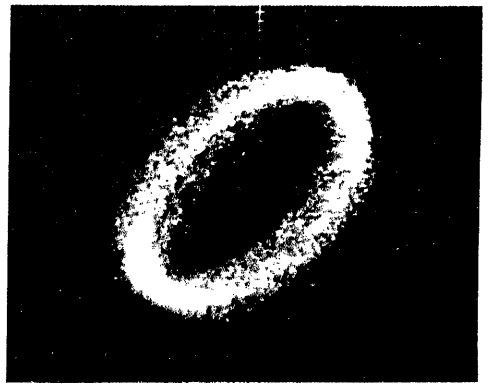
Insert the decentering screwdriver to either one of the holes for adjustment.

Fig. 7-23.

6) Take the DISC out to tighten the 2 screws of the feed base.
7) Apply suitable locking compound to A TAN screw.

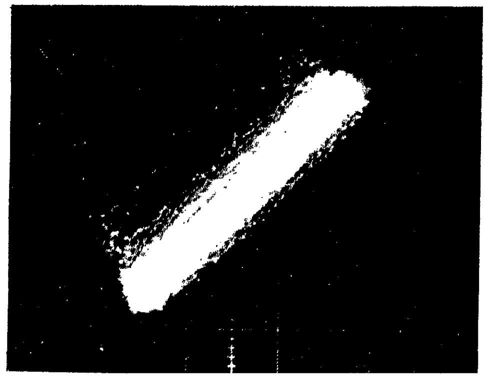
Terminal E, F/TRK, SLED OFF
Oscilloscope X/Y Lissagous range
Difference within 35° with each 20 mV/div.

Before the adjustment.



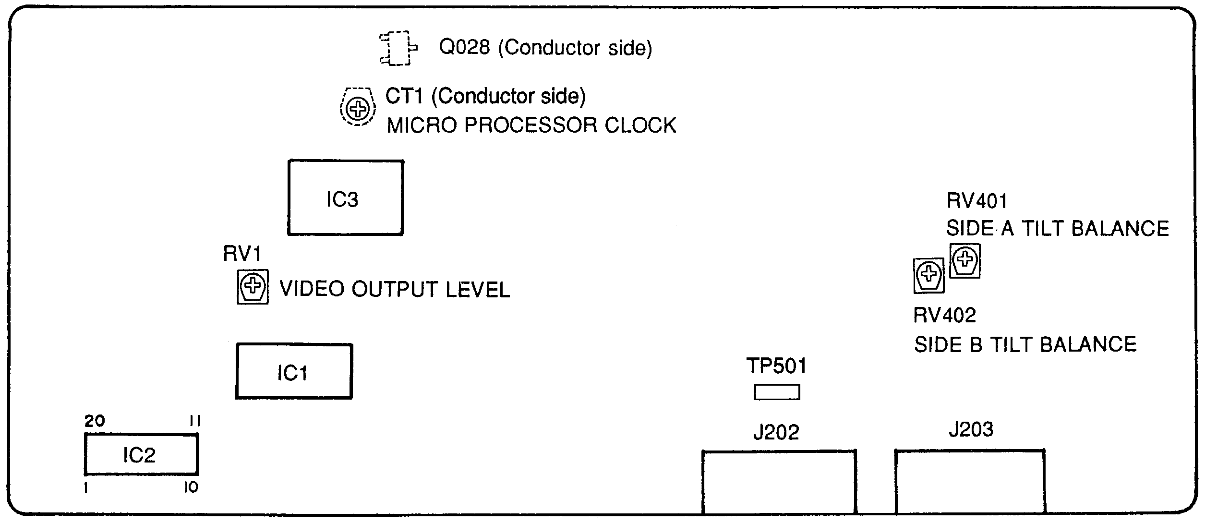
⇩ Make the figure straigh

After the adjustment.

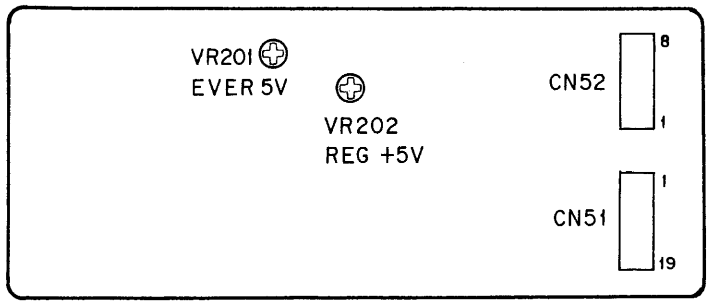


7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

MB-717 Board (Component Side)


Q028 (Conductor side)
CT1 (Conductor side)
MICRO PROCESSOR CLOCK
IC3
RV1
VIDEO OUTPUT LEVEL
IC1
RV401
SIDE A TILT BALANCE
RV402
SIDE B TILT BALANCE
TP501
J202
J203
20
11
IC2
1
10

POWER SUPPLY BLOCK (Component side)


VR201
EVER 5V
VR202
REG +5V
CN52
8
1
CN51
1
19

9-973-702-11

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
95B1648-1
Printed in Japan
© 1995.2
Published by Personal A&V Products Div.
Quality Engineering Dept.

MDP-550/650/A3

RMT-M33A(550)/M37A(650)/M37B(A3)

SONY®

SERVICE MANUAL

US Model
Canadian Model
MDP-550/650
E Model
Hongkong Model
MDP-A3

SUPPLEMENT-1

File this supplement with the Service Manual.

Subject : Change of the POWER BLOCK Printed Wiring Board

- The parts number suffix of the POWER BLOCK printed wiring board is changed as follows.

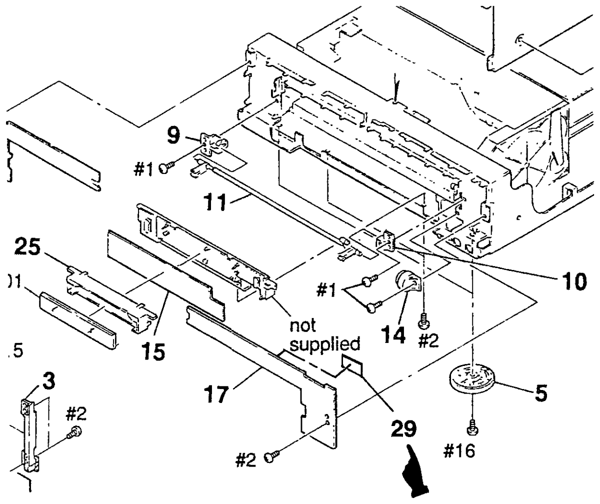
  A3: E .... 1-413-989- $\boxed{21}$ → $\boxed{22}$
  A3: Hong Kong .... 1-413-989- $\boxed{41}$ → $\boxed{42}$
  550/650 .... 1-468-020- $\boxed{11}$ → $\boxed{12}$

Note: Main differences between these parts number suffixes are the parts mounted/unmounted, and changes of the parts values.
When repairing (or ordering repair parts) the POWER BLOCK, refer to this SUPPLEMENT-1 regardless of the parts number suffix of the printed wiring boards.

☞ : Indicates Changed portion.

5-1

5-1-1.CASE AND FROT PANEL ASSEMBLY


9
#1
11
25
01
.5
15
#1
10
not supplied
14
#2
3
#2
17
5
29
#2
#16

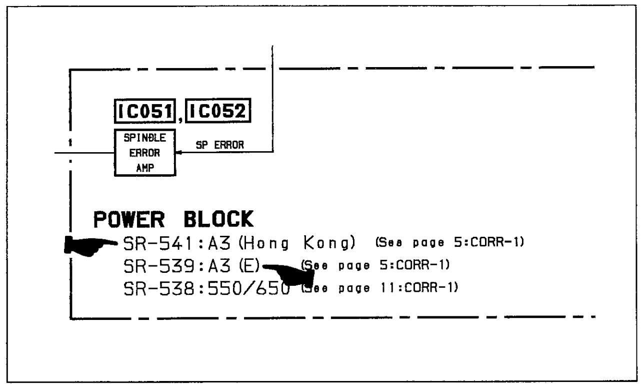
Ref. No.	Part No.	Description	Remarks
* 29	3-347-783-21	SHEET (SW)	

- As the parts number suffix of the POWER BLOCK printed wiring board is changed, the following portions are changed. Please correct the Service Manual (9-973-702-11). The full pages of the schematic diagrams, printed wiring boards and electrical parts lists to be corrected are attached from the next page. (Errors in the schematic diagrams and printed wiring boards are corrected.)

☞ : Indicates changed portion.

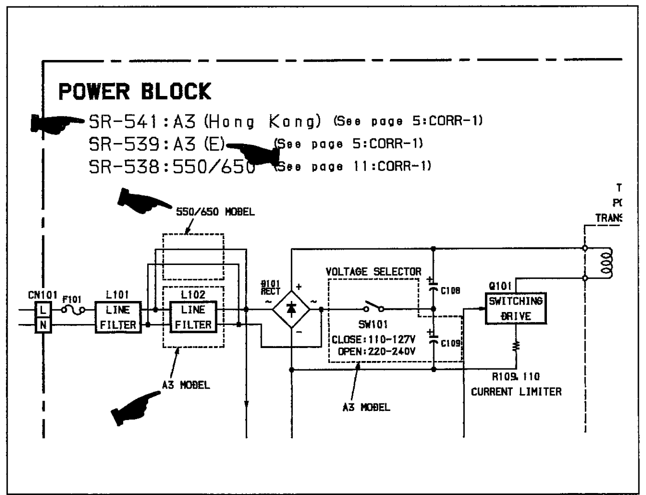
(Page 3-1.)

3-1.OVERALL BLOCK DIAGRAM


IC051, IC052
SPINDLE ERROR AMP
SP ERROR
POWER BLOCK
SR-541 : A3 (Hong Kong) (See page 5:CORR-1)
SR-539 : A3 (E) (See page 5:CORR-1)
SR-538 : 550/650 (See page 11:CORR-1)

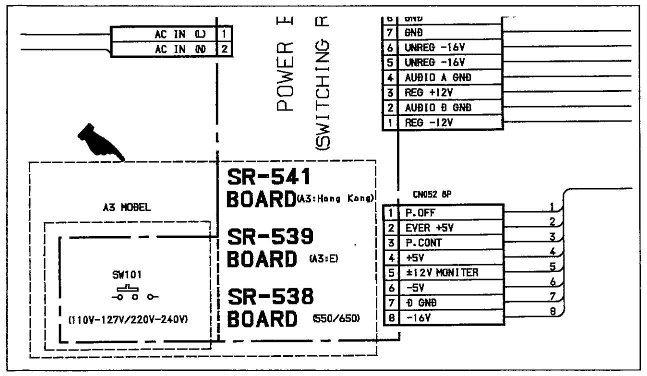
(Page 3-17.)

3-8.POWER BLOCK DIAGRAM


POWER BLOCK
SR-541 : A3 (Hong Kong) (See page 5:CORR-1)
SR-539 : A3 (E) (See page 5:CORR-1)
SR-538 : 550/650 (See page 11:CORR-1)
550/650 MODEL
CN101
F101
L101 LINE FILTER
L102 LINE FILTER
A3 MODEL
D101 RECT
VOLTAGE SELECTOR
C108
C109
SW101
CLOSE:110-127V
OPEN:220-240V
A3 MODEL
Q101 SWITCHING DRIVE
R109, 110 CURRENT LIMITER
T
P
TRANS

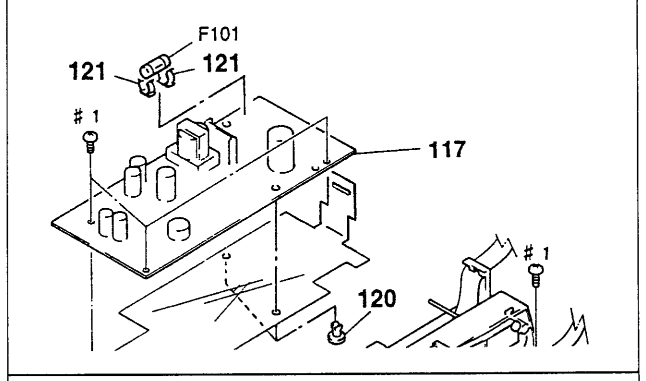
(Page 4-1.)

4-1.FRAME SCHEMATIC DIAGRAM


AC IN (L) 1
AC IN (N) 2
POWER E
(SWITCHING R
7 GND
6 UNREG -16V
5 UNREG -16V
4 AUDIO A GND
3 REG +12V
2 AUDIO D GND
1 REG -12V
A3 MODEL
SW101
(110V-127V/220V-240V)
SR-541 BOARD (A3:Hong Kong)
SR-539 BOARD (A3:E)
SR-538 BOARD (550/650)
CN052 8P
1 P.OFF
2 EVER +5V
3 P.CONT
4 +5V
5 ±12V MONITER
6 -5V
7 D GND
8 -16V
1
2
3
4
5
6
7
8

(Page 5-3.)

5-1-3.MAIN CHASSIS ASSEMBLY

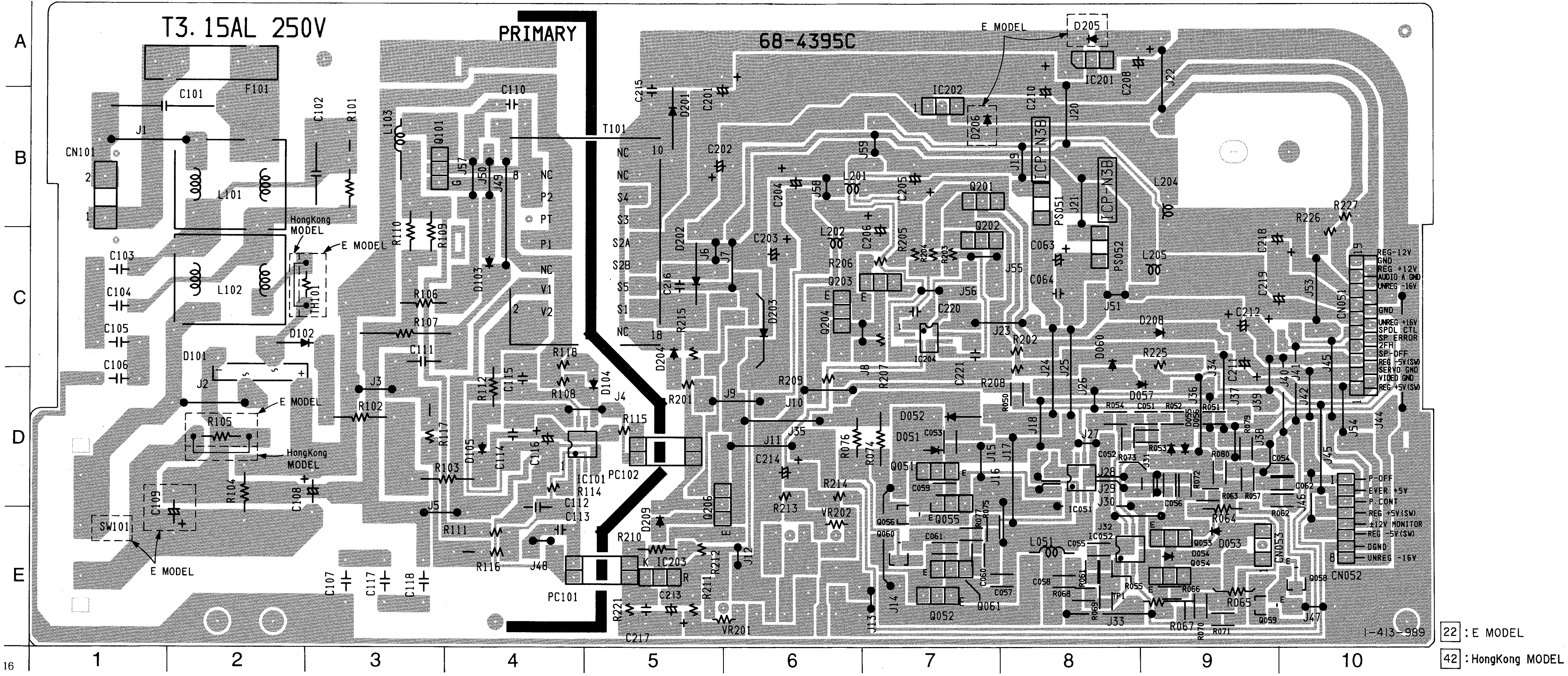

F101
121
121
#1
117
#1
120

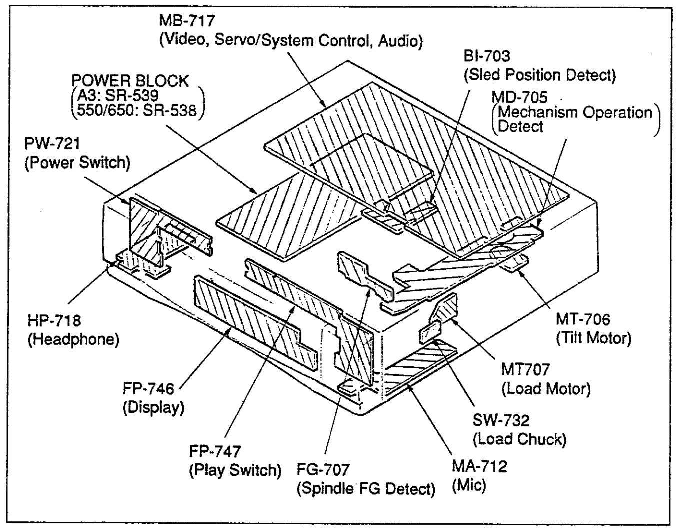
Ref. No.	Part No.	Description	Remarks
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-22	POWER BLOCK (A3:E) ☞	
117	1-413-989-42	POWER BLOCK (A3:HongKong) ☞	
117	1-468-020-12	POWER BLOCK (550/650) ☞	
119	3-962-812-01	SCREW (+BV 3X18)	

POWER BLOCK PRINTED BOARDS (MDP-A3 MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —

POWER BLOCK (A3 MODEL) (SR-539 BOARD:E MODEL,SR-541 BOARD:HongKong MODEL)


T3.15AL 250V
PRIMARY
68-4395C
E MODEL
HongKong MODEL
A
B
C
D
E
1
2
3
4
5
6
7
8
9
10
16
1-413-989
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
CN051
CN052
CN053
CN101
F101
T101
PC101
PC102
IC101
IC201
IC202
IC203
IC204
IC051
IC052
22 : E MODEL
42 : HongKong MODEL

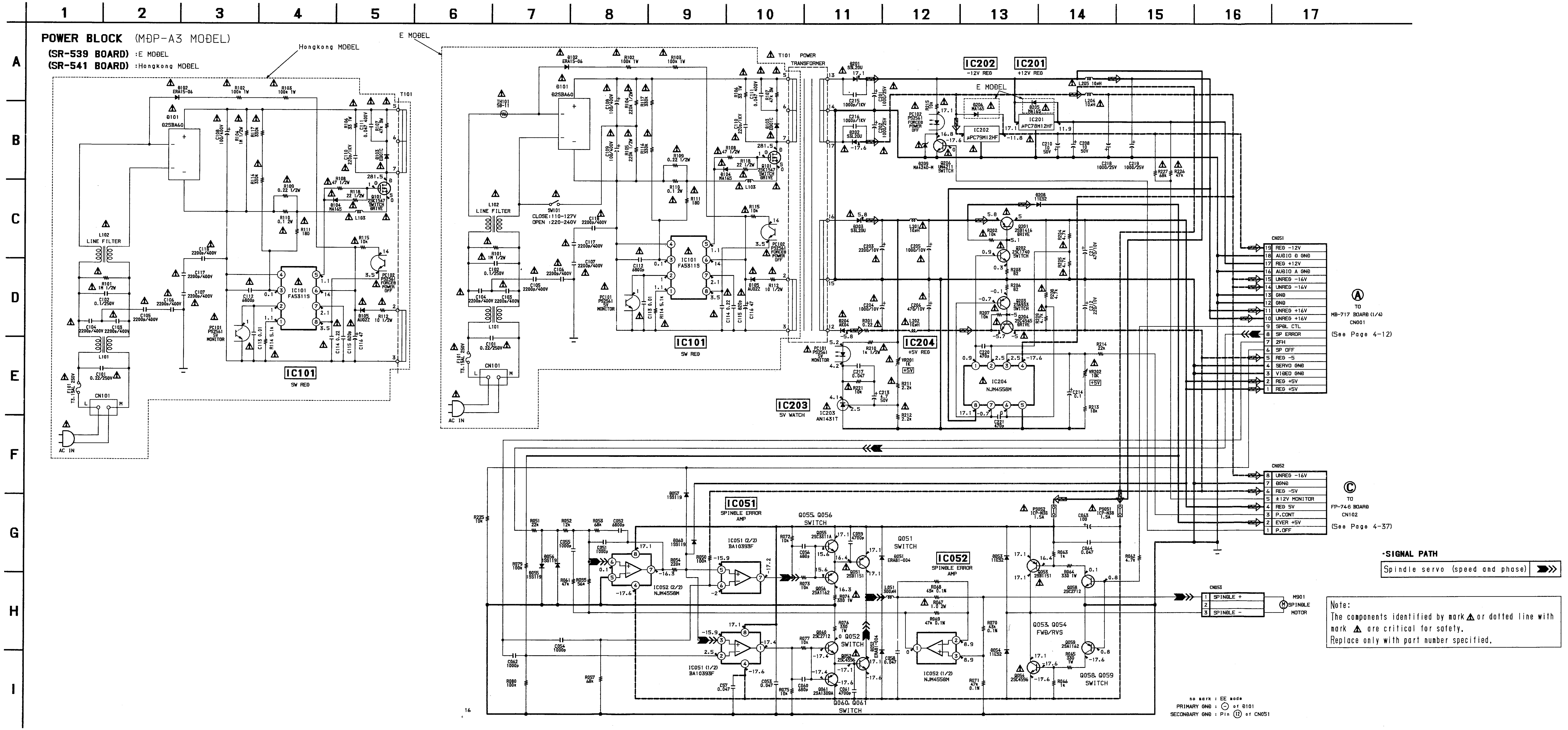

MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
(A3: SR-539
550/650: SR-538)
MD-705
(Mechanism Operation Detect)
PW-721
(Power Switch)
HP-718
(Headphone)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-746
(Display)
SW-732
(Load Chuck)
FP-747
(Play Switch)
FG-707
(Spindle FG Detect)
MA-712
(Mic)

POWER BLOCK

CN051	C-10
CN052	E-10
CN053	E-9
CN101	B-1
D051	D-7
D052	D-7
D053	E-9
D054	E-9
D055	D-9
D056	D-9
D057	D-9
D060	C-8
D101	D-2
D102	C-2
D103	C-4
D104	D-5
D105	D-4
D201	B-5
D202	C-5
D203	C-6
D204	C-5
D205	A-8
D206	B-7
D208	C-9
D209	E-5
IC051	D-8
IC052	E-8
IC101	D-5
IC201	A-8
IC202	B-7
IC203	E-5
IC204	C-7
Q051	D-7
Q052	E-7
Q053	E-9
Q054	E-9
Q055	D-7
Q056	E-7
Q058	E-10
Q059	E-9
Q060	E-7
Q061	E-7
Q101	B-3
Q201	B-7
Q202	C-7
Q203	C-7
Q204	C-6
Q206	D-5
VR201	E-6
VR202	E-6

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-A3 MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —

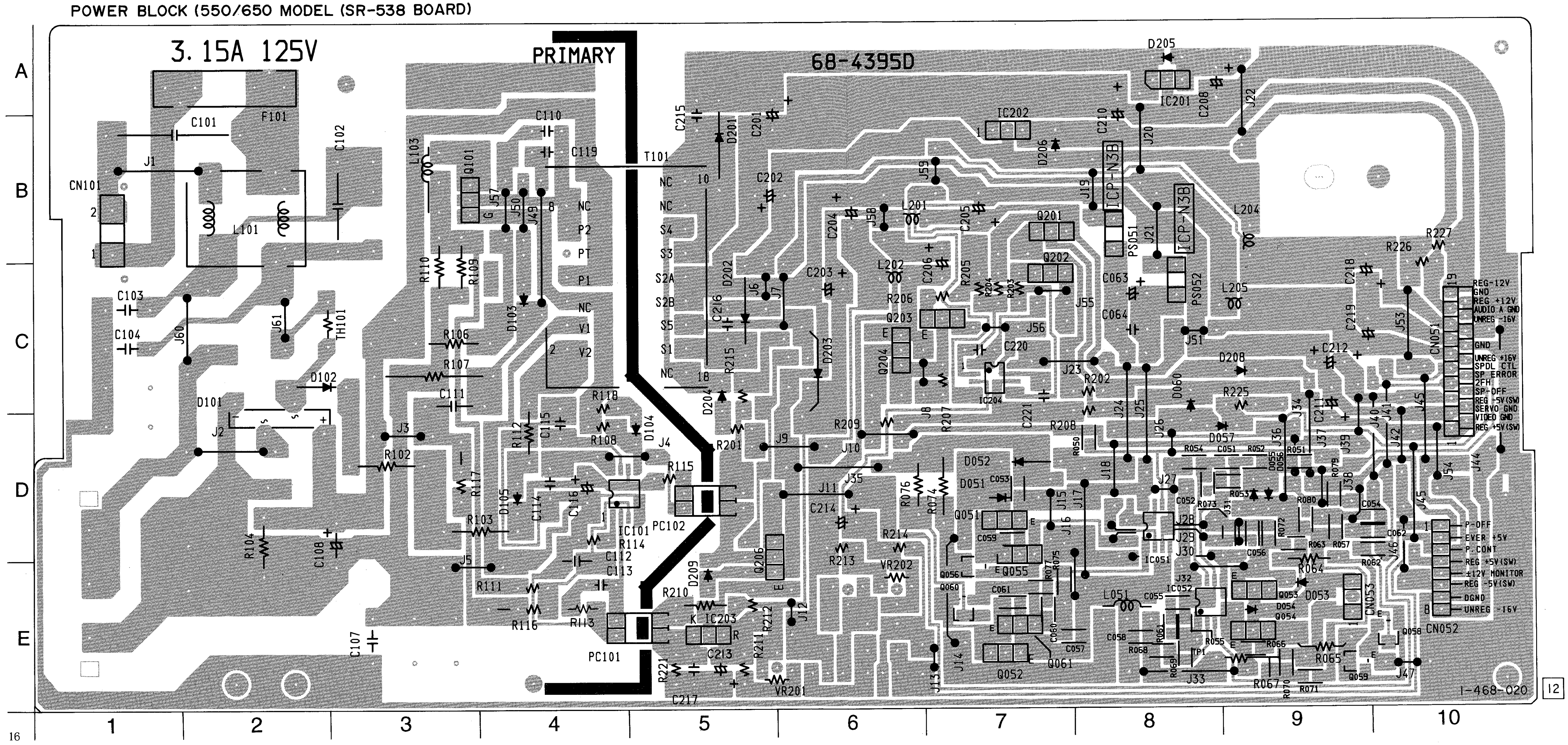

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
A
B
C
D
E
F
G
H
I
POWER BLOCK (MDP-A3 MODEL)
(SR-539 BOARD) :E MODEL
(SR-541 BOARD) :Hongkong MODEL
Hongkong MODEL
E MODEL
D101 B2SBA60
L102 LINE FILTER
L101
CN101
AC IN
SW101 CLOSE :110-127V OPEN :220-240V
IC101 SW REG
IC101 FA5311S
Q101 2SK1547 SWITCH DRIVE
PC101 PS2561 MONITOR
PC102 PS2561 FORCED POWER OFF
T101 POWER TRANSFORMER
IC202 -12V REG
IC201 +12V REG
IC202 µPC79M12HF
IC201 µPC78M12HF
Q203 UN2211 SWITCH
IC204 +5V REG
IC204 NJM4558M
IC203 5V WATCH
IC203 AN1431T
Q201 2SB1416 DRIVE
Q202 2SC1740 SWITCH
CN051
19 REG -12V
18 AUDIO D GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001
(See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-746 BOARD CN102
(See Page 4-37)
IC051 SPINDLE ERROR AMP
IC051 (2/2) BA10393F
IC052 (2/2) NJM4558M
IC051 (1/2) BA10393F
IC052 SPINDLE ERROR AMP
IC052 (1/2) NJM4558M
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q060, Q061 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
PS051 ICP-N38 1.5A
PS052 ICP-N38 1.5A
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR
·SIGNAL PATH
Spindle servo (speed and phase)
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051

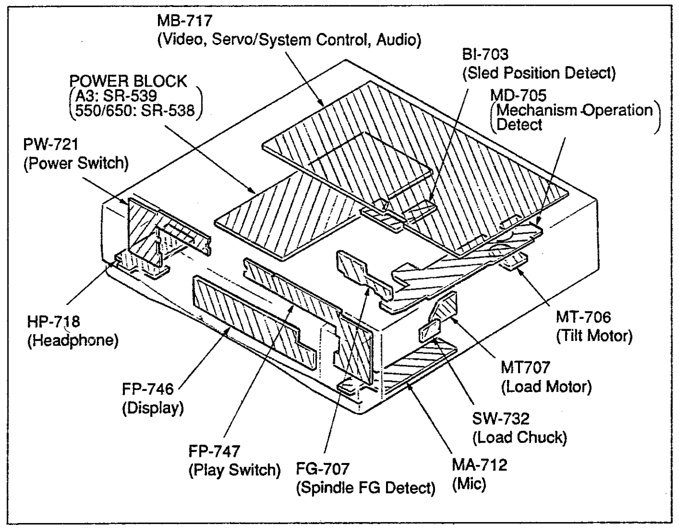
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

POWER BLOCK PRINTED WRITING BOARDS (MDP-550/650 MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —

POWER BLOCK (550/650 MODEL (SR-538 BOARD)


3.15A 125V
PRIMARY
68-4395D
F101
CN101
L101
T101
PC101
PC102
IC101
IC201
IC202
IC203
IC204
ICP-N3B
PS051
PS052
CN051
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
CN052
CN053
1-468-020
12
A
B
C
D
E
1
2
3
4
5
6
7
8
9
10

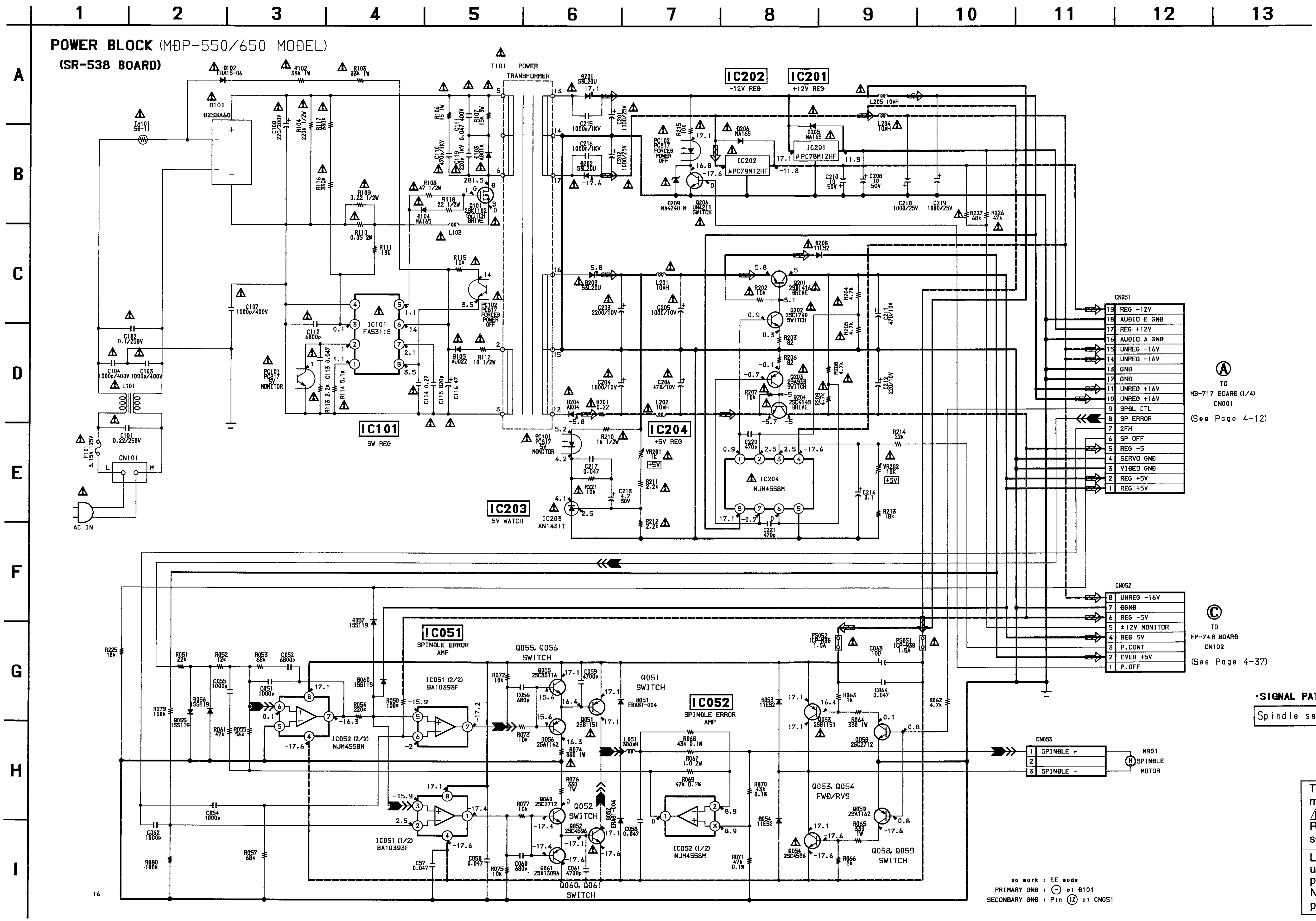

MB-717 (Video, Servo/System Control, Audio)
POWER BLOCK (A3: SR-539 550/650: SR-538)
BI-703 (Sled Position Detect)
MD-705 (Mechanism Operation Detect)
PW-721 (Power Switch)
HP-718 (Headphone)
MT-706 (Tilt Motor)
MT707 (Load Motor)
FP-746 (Display)
SW-732 (Load Chuck)
FP-747 (Play Switch)
FG-707 (Spindle FG Detect)
MA-712 (Mic)

POWER BLOCK

CN051	C–10
CN052	E–10
CN053	E–9
CN101	B–1
D051	D–7
D052	D–7
D053	E–9
D054	E–9
D055	D–9
D056	D–9
D057	D–9
D060	C–8
D101	D–2
D102	C–2
D103	C–4
D104	D–5
D105	D–4
D201	B–5
D202	C–5
D203	C–6
D204	C–5
D205	A–8
D206	B–7
D208	C–9
D209	E–5
IC051	D–8
IC052	E–8
IC101	D–5
IC201	A–8
IC202	B–7
IC203	E–5
IC204	C–7
Q051	D–7
Q052	E–7
Q053	E–9
Q054	E–9
Q055	D–7
Q056	E–7
Q058	E–10
Q059	E–9
Q060	E–7
Q061	E–7
Q101	B–3
Q201	B–7
Q202	C–7
Q203	C–7
Q204	C–6
Q206	D–5
VR201	E–6
VR202	E–6

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-550/650 MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
POWER BLOCK (MDP-550/650 MODEL)
(SR-538 BOARD)
T101 POWER TRANSFORMER
TH101 SG-11
D101 D2SBA60
R102 ERA15-06
R102 33k 1W
R103 33k 1W
C108 220/200V
R104 220k 1/2W
R117 330k
R116 330k
R109 0.22 1/2W
R110 0.05 2W
R111 180
C107 1000p/400V
C102 0.1/250V
C104 1000p/400V
C103 1000p/400V
L101
C101 0.22/250V
F101 3.15A 125V
CN101
AC IN
C112 6800p
PC101 PC817 SW MONITOR
IC101 FA5311S
IC101
SW REG
R106 15 1W
C111 0.047 400V
R107 15k 1W
C110 470p/1kV
C119 220p 1kV
D103 AU01A
R108 47 1/2W
R118 22 1/2W
Q101 2SK1102 SWITCH DRIVE
D104 MA165
L103
R115 10k
PC102 PC817 FORCED POWER OFF
D105 AU02Z
R112 10 1/2W
C113 0.047
R114 5.1k
R113 2.2k
C114 0.22
C115 820p
C116 47
D201 S5L20U
C215 1000p/1kV
C216 1000p/1kV
D202 S5L20U
C201 1000/25V
C202 1000/25V
IC202
-12V REG
IC201
+12V REG
PC102 PC817 FORCED POWER OFF
R215 10k
D206 MA165
IC202 μPC79M12HF
D205 MA165
IC201 μPC78M12HF
D209 MA4240-M
Q206 UN4211 SWITCH
C210 10 50V
C208 10 50V
C218 1000/25V
C219 1000/25V
R227 68k
R226 47k
L205 10μH
L204 10μH
D208 11ES2
D203 S5L20U
C203 2200/10V
L201 10μH
C205 1000/10V
R202 10k
Q201 2SB1416 DRIVE
Q202 2SC1740 SWITCH
R203 82
R204 4.7k
R205 4.7k
C211 470/10V
R206 82
Q203 2SA933 SWITCH
Q204 2SC4545 DRIVE
R207 10k
R208 4.7k
R209 4.7k
C212 220/10V
D204 AK04
R201 0.22
C204 1000/10V
C206 470/10V
L202 10μH
IC204
+5V REG
PC101 PC817 5V MONITOR
R210 1k 1/2W
VR201 1k
+5V
C217 0.047
R221 10k
C213 4.7 50V
R211 2.2k
R212 2.2k
IC203
5V WATCH
IC203 AN1431T
C220 470p
IC204 NJM4558M
C221 470p
R214 22k
VR202 10k
+5V
C214 0.1
R213 18k
CN051
19 REG -12V
18 AUDIO D GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ
TO
MB-717 BOARD (1/4)
CN001
(See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ
TO
FP-746 BOARD
CN102
(See Page 4-37)
IC051
SPINDLE ERROR AMP
Q055, Q056
SWITCH
Q051
SWITCH
IC052
SPINDLE ERROR AMP
IC051 (2/2) BA10393F
IC052 (2/2) NJM4558M
IC051 (1/2) BA10393F
IC052 (1/2) NJM4558M
R225 10k
R051 22k
R052 12k
R053 68k
C052 6800p
C055 1000p
C051 1000p
D056 1SS119
D055 1SS119
R079 100k
R061 47k
R055 56k
D057 1SS119
D060 1SS119
R054 220k
R050 100k
Q055 2SC3311A
C059 4700p
C056 680p
Q056 2SA1162
Q051 2SB1151
R073 10k
R074 330 1W
D051 ERA81-004
L051 300μH
R068 43k 0.1%
R067 1.0 2W
R069 47k 0.1%
R070 43k 0.1%
R071 47k 0.1%
PS052 ICP-N38 1.5A
PS051 ICP-N38 1.5A
C063 100
C064 0.047
R062 4.7k
D053 11ES2
R063 1k
Q053 2SB1151
R064 330 1W
Q058 2SC2712
Q053, Q054 FWD/RVS
Q059 2SA1162
R065 330 1W
Q054 2SC4596
R066 1k
Q058, Q059 SWITCH
D054 11ES2
R076 330 1W
Q060 2SC2712
Q052 SWITCH
Q052 2SC4596
D052 ERA81-004
C058 0.047
R077 10k
Q061 2SA1309A
C061 4700p
Q060, Q061 SWITCH
C060 680p
R075 10k
C053 0.047
C57 0.047
R057 68k
C054 1000p
C062 1000p
R080 100k
CN053
1 SPINDLE +
2
3 SPINDLE -
M901
SPINDLE MOTOR
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051
16

•SIGNAL PATH

Spindle servo (speed and phase)	➤»»

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

POWER BLOCK

ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF

- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

Ref. No.	Part No.	Description	Remarks
	1-413-989-22	POWER BLOCK (A3:E) ***********	
	1-413-989-42	POWER BLOCK (A3:Hong Kong) ***********	
	1-468-020-12	POWER BLOCK (550/650) ***********	
			(Ref.No.5,000 Series)
⚠	1-533-223-11	HOLDER, FUSE	
		< CAPACITOR >	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C052	1-163-019-00	MULTILAYER CERAMIC 6800PF 10% 50V	
C053	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V	
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C056	1-163-007-11	MULTILAYER CERAMIC 680PF 10% 50V	
C057	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V	
C058	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V	
C059	1-163-017-00	MULTILAYER CERAMIC 4700PF 10% 50V	
C060	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C061	1-163-017-00	MULTILAYER CERAMIC 4700PF 10% 50V	
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF 20% 50V	
C064	1-130-491-00	FILM 0.047uF 5% 50V	
⚠C101	9-902-038-01	METALLIZED 0.22uF 250V	
⚠C102	9-900-521-01	METALLIZED 0.1uF 250V	
⚠C103	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C103	1-161-741-00	CERAMIC 1000PF 10% 400V	(550/650)
⚠C104	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C104	1-161-741-00	CERAMIC 1000PF 10% 400V	(550/650)
⚠C105	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C106	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C107	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C107	1-161-741-00	CERAMIC 1000PF 10% 400V	(550/650)
⚠C108	9-933-773-01	ALUMINUM ELECTIC 100uF 400V	(A3)
⚠C108	9-900-523-01	ALUMINUM ELECTIC 220uF 200V	(550/650)

Ref. No.	Part No.	Description	Remarks
⚠C109	9-933-773-01	ALUMINUM ELECTIC 100uF 400V	(A3:E)
⚠C110	9-909-673-01	CERAMIC 220PF 1kV	(A3)
⚠C110	9-933-752-01	CERAMIC 470PF 1kV	(550/650)
⚠C111	9-900-525-01	METALLIZED 0.047uF 400V	
⚠C112	1-106-363-00	FILM 0.0068uF 5% 50V	
⚠C113	1-130-483-00	METAILLIZED 0.01uF 5% 50V	(A3)
⚠C113	1-130-491-00	METAILLIZED 0.047uF 5% 50V	(550/650)
⚠C114	1-137-378-11	METALLIZED 0.22uF 5% 50V	
⚠C115	1-130-470-00	FILM 820PF 5% 50V	
⚠C116	1-216-967-11	ALUMINUM ELECTRIC 47uF 20% 50V	
⚠C117	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C118	1-161-742-00	CERAMIC 2200PF 20% 400V	(A3)
⚠C119	9-909-673-01	CERAMIC 220PF 1kV	(550/650)
⚠C201	1-124-525-11	ALUMINUM ELECTRIC 1000uF 20% 25V	
⚠C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF 20% 25V	
⚠C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF 20% 10V	
⚠C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF 20% 10V	
⚠C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF 20% 10V	
⚠C206	1-126-925-11	ALUMINUM ELECTRIC 470uF 20% 10V	
C208	1-126-964-51	ALUMINUM ELECTRIC 10uF 20% 50V	
C210	1-126-964-51	ALUMINUM ELECTRIC 10uF 20% 50V	
C211	1-126-925-11	ALUMINUM ELECTRIC 470uF 20% 10V	
C212	1-126-923-11	ALUMINUM ELECTRIC 220uF 20% 10V	
C213	1-126-963-11	ALUMINUM ELECTRIC 4.7uF 20% 50V	
C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF 50V	
C215	9-909-680-01	CERAMIC 1000PF 1kV	
C216	9-909-680-01	CERAMIC 1000PF 1kV	
C217	1-130-491-00	FILM 0.047uF 5% 50V	
C218	1-126-942-61	ALUMINUM ELECTRIC 1000uF 20% 25V	
C219	1-126-942-61	ALUMINUM ELECTRIC 1000uF 20% 25V	
C220	1-130-467-00	FILM 470PF 5% 50V	
C221	1-130-467-00	FILM 470PF 5% 50V	

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN051	1-695-342-31	CONNECTOR 19P	
CN052	1-506-473-11	CONNECTOR 8P	
CN053	1-564-506-11	CONNECTOR 3P	
CN101	1-564-419-11	CONNECTOR 2P	
		< DIODE >	
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
⚠D101	8-719-510-19	BRIDGE DIODE D2SBA60	
⚠D102	9-902-050-01	DIODE ERA15-06	
⚠D103	8-719-030-25	DIODE EG01C (A3)	
⚠D103	9-900-512-01	DIODE AG01A (550/650)	
⚠D104	9-900-514-01	DIODE MA165	
⚠D105	9-900-535-01	DIODE AU02Z	
⚠D201	8-719-510-72	DIODE S3L20U	
⚠D202	8-719-510-72	DIODE S3L20U	
⚠D203	8-719-510-72	DIODE S3L20U	
⚠D204	8-719-043-74	DIODE AK04	
⚠D205	9-900-514-01	DIODE MA165 (A3:E,550/650)	
⚠D206	9-900-514-01	DIODE MA165 (A3:E,550/650)	
⚠D208	8-719-200-82	DIODE 11ES2	
⚠D209	8-719-035-04	ZENNER DIODE MA4240	
		< FUSE >	
⚠F101	1-532-286-00	FUSE TIME LUG (3.15A 250V) (A3)	
⚠F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (550/650)	
		< IC >	
IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC UPC4558G2	
⚠IC101	8-759-062-58	IC FA5311S	
⚠IC201	8-759-701-79	IC NJM78M12FA	
⚠IC202	8-759-929-65	IC LM7912CT	
⚠IC203	9-900-532-01	IC AN1431T	
⚠IC204	8-759-100-96	IC UPC4558G2	
		< COIL >	
L051	1-424-219-11	CHORKE COIL 300uH	
⚠L101	9-909-675-01	LINE FILTER	

Ref. No.	Part No.	Description	Remarks
⚠L102	9-909-675-01	LINE FILTER (A3)	
⚠L103	9-904-796-01	BEAD CORE	
⚠L201	9-909-681-01	CHORKE COIL 10uH	
⚠L202	9-909-681-01	CHORKE COIL 10uH	
⚠L204	9-909-681-01	CHORKE COIL 10uH	
⚠L205	9-909-681-01	CHORKE COIL 10uH	
		< PHOTO COUPLER >	
⚠PC101	9-909-676-01	PHOTO COUPLER (A3)	
⚠PC101	9-900-519-01	PHOTO COUPLER (550/650)	
⚠PC102	9-909-676-01	PHOTO COUPLER (A3)	
⚠PC102	9-900-519-01	PHOTO COUPLER (550/650)	
		< IC LINK >	
⚠PS051	1-532-675-21	IC LINK (ICP-N38 1.5A)	
⚠PS052	1-532-675-21	IC LINK (ICP-N38 1.5A)	
		< TRANSISTOR >	
⚠Q051	8-729-117-11	TRANSISTOR 2SB1151-L	
⚠Q052	8-729-019-31	TRANSISTOR 2SC4596E (A3)	
⚠Q052	8-729-019-32	TRANSISTOR 2SC4596F (550/650)	
⚠Q053	8-729-117-11	TRANSISTOR 2SB1151-L	
⚠Q054	8-729-019-31	TRANSISTOR 2SC4596E (A3)	
⚠Q054	8-729-019-32	TRANSISTOR 2SC4596F (550/650)	
Q055	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q056	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q058	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q059	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q060	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q061	8-729-119-76	TRANSISTOR 2SA1175-HFE	
⚠Q101	9-909-669-01	TRANSISTOR 2SK1547 (A3)	
⚠Q101	9-933-750-01	TRANSISTOR 2SK1102 (550/650)	
⚠Q201	8-729-021-99	TRANSISTOR 2SB1416-R	
⚠Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE	
⚠Q203	8-729-119-76	TRANSISTOR 2SA1175-HFE	
⚠Q204	9-909-678-01	TRANSISTOR 2SC4545-R	
⚠Q206	8-729-900-80	TRANSISTOR DTC114ES	
		< RESISTOR >	
R050	1-216-097-00	THICK FILM 100K 1/10W	
R051	1-216-081-00	THICK FILM 22K 1/10W	
R052	1-216-075-00	THICK FILM 12K 1/10W	
R053	1-216-093-11	THICK FILM 68K 1/10W	
R054	1-216-105-00	THICK FILM 220K 1/10W	
R055	1-216-091-00	THICK FILM 56K 1/10W	
R057	1-216-093-11	THICK FILM 68K 1/10W	
R061	1-216-089-00	THICK FILM 47K 1/10W	
R062	1-216-065-00	THICK FILM 4.7K 1/10W	

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
R063	1-216-049-11	THICK FILM 1K 1/10W	
R064	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R065	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R066	1-216-049-11	THICK FILM 1K 1/10W	
⚠R067	1-216-369-00	CARBON 1 2W	
R068	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R069	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R070	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R071	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R072	1-216-073-00	THICK FILM 10K 1/10W	
R073	1-216-073-00	THICK FILM 10K 1/10W	
⚠R074	1-215-866-11	CARBON 330 5% 1W	
R075	1-216-073-00	THICK FILM 10K 1/10W	
R076	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R077	1-216-073-00	THICK FILM 10K 1/10W	
R079	1-216-097-00	THICK FILM 100K 1/10W	
R080	1-216-097-00	THICK FILM 100K 1/10W	
⚠R101	9-900-394-01	NON-FLAMABLE CARBON 1M 1/2W	(A3)
⚠R102	1-218-642-11	METAL OXIDE FILM 100K 1W	(A3)
⚠R102	1-215-878-00	METAL OXIDE FILM 33K 1W	(550/650)
⚠R103	1-218-642-11	METAL OXIDE FILM 100K 1W	(A3)
⚠R103	1-215-878-00	METAL OXIDE FILM 33K 1W	(550/650)
⚠R104	1-214-921-00	CARBON 220K 1/2W	(A3:E,550/650)
⚠R104	1-260-135-11	CARBON 1M 5% 1/2W	(A3:Hong Kong)
⚠R105	1-214-921-11	CARBON 220K 1/2W	(A3:E)
⚠R106	1-215-860-11	METAL OXIDE FILM 33 1W	(A3)
⚠R106	1-215-858-00	METAL OXIDE FILM 15 1W	(550/650)
⚠R107	1-215-927-00	METAL OXIDE FILM 47K 3W	(A3)
⚠R107	1-215-924-00	METAL OXIDE FILM 15K 3W	(550/650)
⚠R108	1-212-974-00	NON-FLAMABLE CARBON 47 1/2W	
⚠R109	9-909-670-01	METAL FILM 0.22 1/2W	
⚠R110	9-909-671-01	CEMENT 0.1 2W	(A3)
⚠R110	9-933-751-01	CEMENT 0.05 2W	(550/650)
⚠R111	1-249-408-11	CARBON 180 1/4W	
⚠R112	1-212-958-00	NON-FLAMABLE CARBON 10 1/2W	
⚠R113	1-247-839-31	CARBON 2.2K 5% 1/4W	(550/650)
⚠R114	1-247-848-11	CARBON 5.1K 1/4W	
⚠R115	1-247-855-31	CARBON 10K 1/4W	
⚠R116	1-247-891-00	CARBON 330K 1/4W	
⚠R117	1-247-891-00	CARBON 330K 1/4W	
⚠R118	1-212-966-00	NON-FLAMABLE CARBON 22 1/2W	
⚠R201	9-909-679-01	FUSE 0.22 1/4W	
⚠R202	1-247-855-31	CARBON 10K 1/4W	
R203	1-249-404-00	CARBON 82 1/4W	
⚠R204	1-247-847-11	CARBON 4.7K 1/4W	
⚠R205	1-247-847-11	CARBON 4.7K 1/4W	
R206	1-249-404-00	CARBON 82 1/4W	
⚠R207	1-247-855-31	CARBON 10K 1/4W	
⚠R208	1-247-847-11	CARBON 4.7K 1/4W	

Ref. No.	Part No.	Description	Remarks
⚠R209	1-247-847-11	CARBON 4.7K	1/4W
⚠R210	1-260-099-11	CARBON 1K	1/2W
⚠R211	1-247-839-31	CARBON 2.2K 5%	1/4W
⚠R212	1-247-839-31	CARBON 2.2K 5%	1/4W
R213	1-249-432-11	CARBON 18K	1/4W
R214	1-249-433-11	CARBON 22K	1/4W
⚠R215	1-247-855-31	CARBON 10K	1/4W
⚠R221	1-247-855-31	CARBON 10K	1/4W
R225	1-247-855-31	CARBON 10K	1/4W
⚠R226	1-247-871-11	CARBON 47K	1/4W
⚠R227	1-249-439-11	CARBON 68K	1/4W

< SWITCH >

Ref. No.	Part No.	Description	Remarks
⚠SW101	1-572-675-11	POWER SWITCH	(A3:E)

< TRANSFORMER >

Ref. No.	Part No.	Description	Remarks
⚠T101	9-909-674-01	SWITCHING TRANSFORMER	(A3)
⚠T101	9-933-753-01	SWITCHING TRANSFORMER	(550/650)

< THERMISTOR >

Ref. No.	Part No.	Description	Remarks
⚠TH101	9-904-783-01	POWER THERMISTOR	(A3:E,550/650)

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remarks
⚠VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
⚠VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

Note: The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

English
95G1646-1
Printed in Japan
© 1995.7
Published by Personal A&V Products Div.
Quality Engineering Dept.

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

9-973-702-81